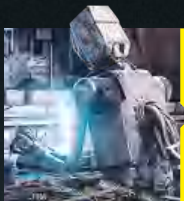




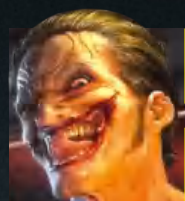
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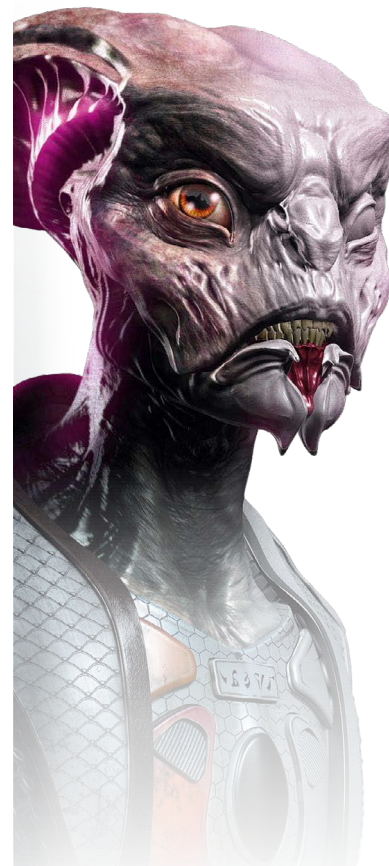


We need your help to reshape the CG industry! This month we're launching an online survey to discover the 'state of the industry'. The aim is to discover what working conditions are like, the tech or apps that are changing how you create art and what health the CG industry is in. If you can find the time, please fill in our survey, the results will be available in 2016! The data we receive will be available to whoever wants to see and use it, and we're hoping the results may help change the industry for the better. To be a part of the CG Industry survey visit www.creativebloq.com/cgsurvey and have your say on the CG industry!

Ian Dean, editor
ian.dean@futurenet.com

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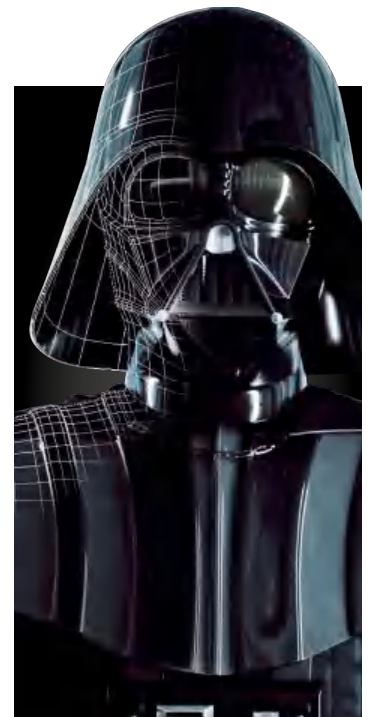
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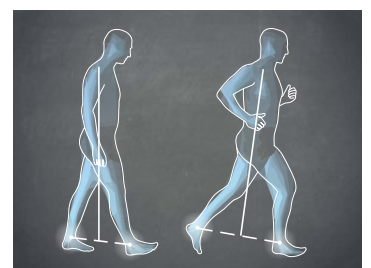
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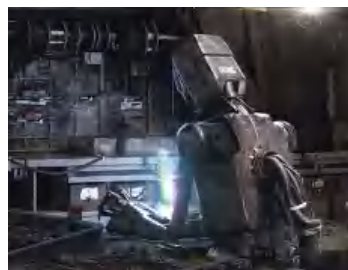


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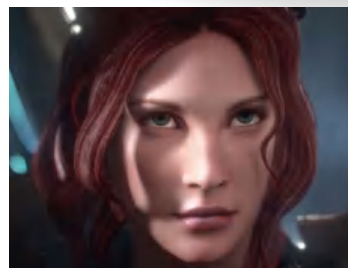


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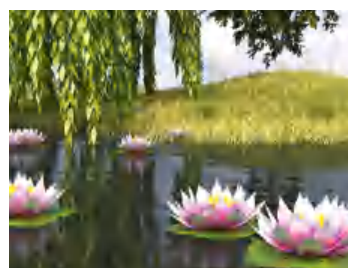
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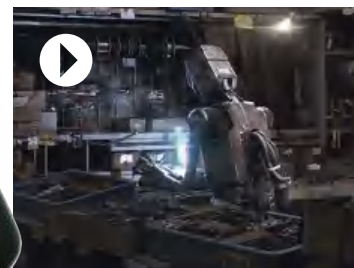


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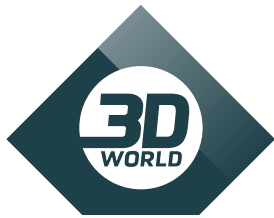
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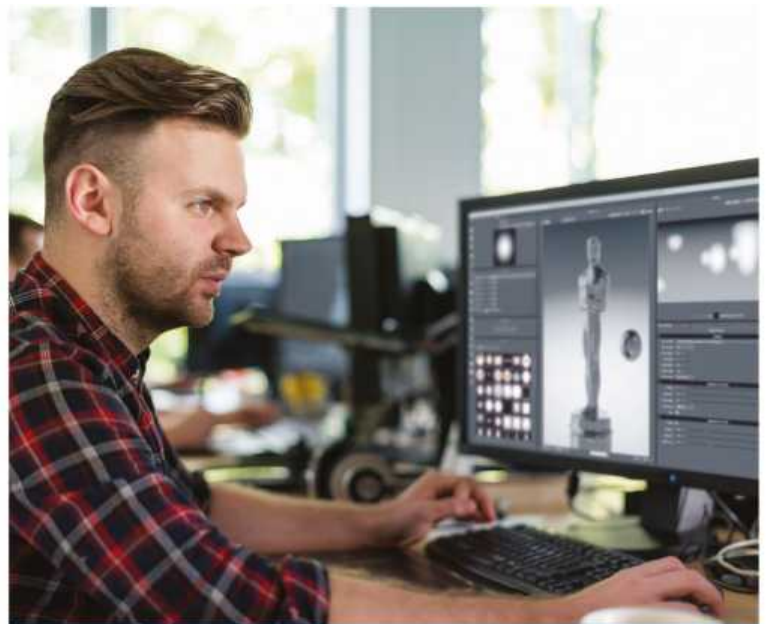
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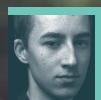


ARTIST

SHOWCASE

The best digital art from
the CG community

TOAD



ARTIST Romain Lavoine
SOFTWARE Maya, Mari,
Photoshop, Arnold
(alShaders), Nuke

Resting in a golden woodland glow, Romain Lavoine's realistic toad required a lot of research and careful preparation to get a perfect lifelike look. "Creating realistic materials is always a challenge," he explains. "You have to understand how the material works in the real world in order to create something believable in CG. Before I start a project I spend a lot of time looking for good references, which I will come back to all the time." Fortunately for Romain, creating the toad was a chance to indulge in his biggest influence: nature. "I can spend hours observing nature and thinking about how I could recreate it in CG."

Currently studying at the ESMA Montpellier, Romain used this project to hone his 3D modelling craft. "I've got a fairly general skillset, including modelling and rigging," he says. "But I want to specialise in lighting, shading and compositing."

Completed in his spare time over three weeks, Romain's toad really shows off his lighting and shading talents. "I light my scene once I've finished the modelling," he says. "Arnold and the alShaders are very useful; they let you separate your lights into different passes and give you the chance to change the intensity and colour in compositing."

FYI

See more of Romain's realistic work at
www.lavoineromain.com



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3D WORLD VIEW

"Romain's passion for nature is clear to see and his investment in reference material has paid off. The lighting and shading is superb."

IAN DEAN
Editor



Creating realistic materials
is always a challenge

SISTER OF BATTLE



ARTIST Gurjeet Singh
SOFTWARE ZBrush, Maya,
DynaMesh, V-Ray, Photoshop,
Marmoset Toolbag



I try to gather as many
references as I can

With a passion for comic books and superheroes, Gurjeet Singh's artistic talents have lead to him working on projects that feature his favourite characters, such as Batman: Arkham Origins.

Having worked on games over the past five years, including titles like Firefall, Lords of the Fallen and Evolve, Gurjeet now fits in his projects around work at an outsource company. "I started this a while ago working in my free time," he says. "But in real production time, from start to finish, I've probably worked on this for around seven weeks."

For this project Gurjeet changed tack and focused instead on the world of tabletop gaming, in particular Warhammer 40,000. Based on the concept drawings of 2D and 3D artist Ted Bargeon, this Sister of Battle gave Gurjeet the opportunity to try out some new techniques. "It was the first time I've ever done PBR texturing," he reveals.

Drawing inspiration from existing artwork and figures suits how Gurjeet works. "I try to gather as many references as I can," he explains. "I try to get the proportion, silhouette and forms right at first with ZBrush, then I remodel with Maya. Adding more detail afterwards back in ZBrush is the most fun part."

FYI

See more of Gurjeet's work by visiting
www.bit.ly/Gurjeet-singh



3D WORLD VIEW

"Gurjeet's work certainly demonstrates a range of techniques. I love the intricate detail created in ZBrush."

FELICITY BARR
Production editor





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THE SUMMER HOUSE



ARTIST
Romi Valentino
SOFTWARE 3ds Max 2014,
Photoshop, V-Ray, ZBrush

From the steam curling out of a fresh cup of coffee, to the scratches carved into a garden lamp, Romi Valentino's Summer House demonstrates how an architectural picture can be filled with as much character as a portrait or still life composition. Dotted with objects that play off against one another, including a spiritual self-help book and a tricycle abandoned in the long grass, it's no surprise that Romi's main inspiration was his own family.

Currently living in south-east Asia, Romi works long distance for London-based CGI company River Film Studios. Creating The Summer House in his spare time, the project took Romi just over a month to complete. "I enjoyed the learning process as I made it all – right down to the smallest part," he explains. "I was in the zone, so much so that I didn't realise it was 2.30am and I needed to sleep. Instead I was making trees from SpeedTree!"

With a portfolio that includes award-winning 3D building designs and interiors, Romi's Summer House is the latest in an impressive collection that knows how to balance realism and character.

Fri Find out more about Romi's work at www.romi3d.wix.com/3dart



EBOLA VIRUS



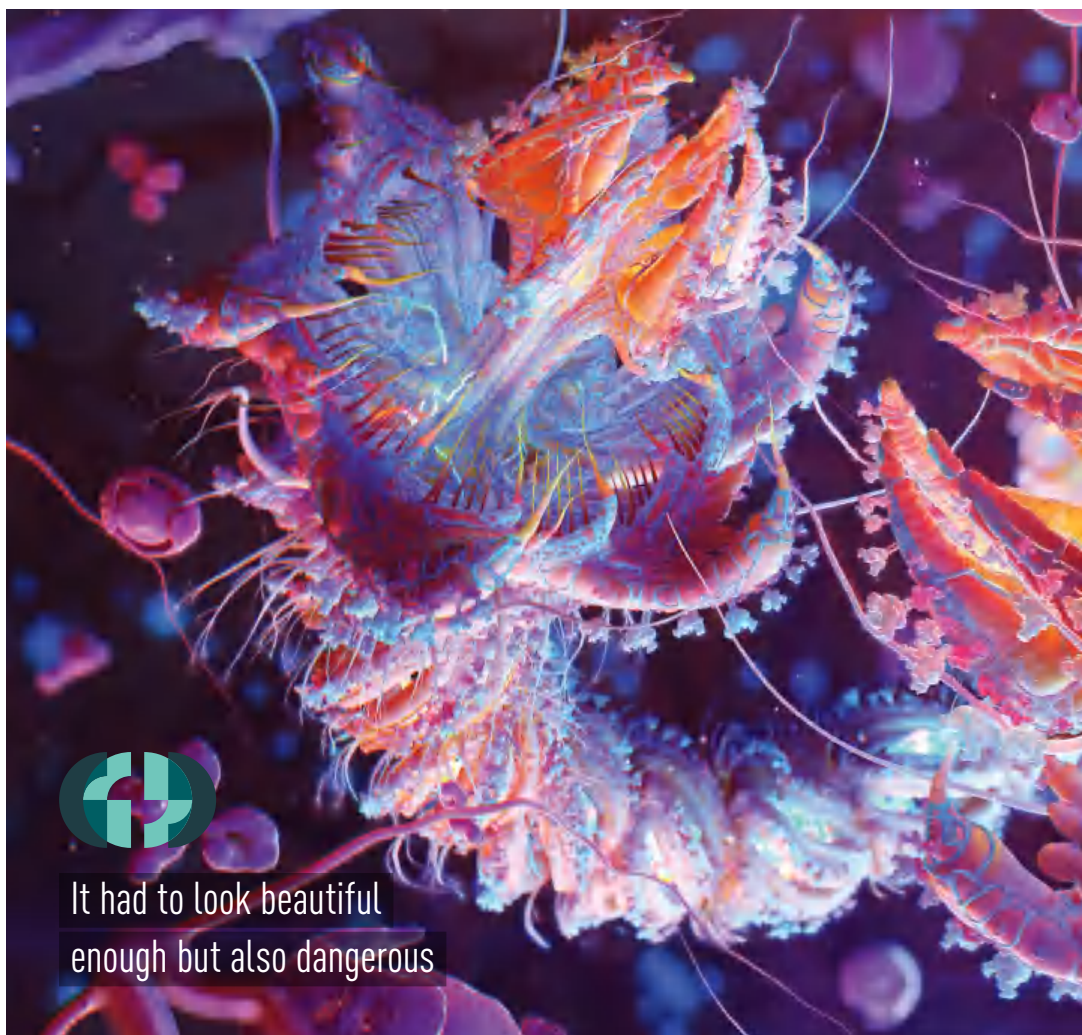
ARTIST Alexey Kashpersky
SOFTWARE ZBrush, V-Ray,
3ds Max, Photoshop, After
Effects, autoPACK

Packed with lurid colours and floating coils of genetic material, Alexey Kashpersky's Ebola Virus is as beautiful as it is malignant. "Is it a special form of life?" Alexey ponders. "No, it's a special form of death."

Now working as a medical artist at Radius Digital Science, Alexey specialises in medicine and microbiology, and has won international competitions in the field of scientific visualisation. Having previously worked on fantasy illustrations and 3D sculpting, it's interesting to see how this brings his work to life. "I wanted to transform Ebola into something fantastic and something that had its own unique character," he explains. "It had to look beautiful enough but also dangerous, as it is one of the most dangerous killers in the world."

Completed as part of a research and development project for Radius Digital Science, Ebola Virus took him three months to complete. "Everything is modelled by hand," says Alexey. "Some specific elements like the protein trees were taken from autoPACK, a specific program used by medical illustrators. The whole ebola chain was a challenge because it required different levels of optimisation that depended on how close it was to the camera."

Fri Explore more of Alexey's work by visiting www.kashpersky.com



It had to look beautiful
enough but also dangerous



I enjoyed the learning process
as I made it all – right down
to the smallest part



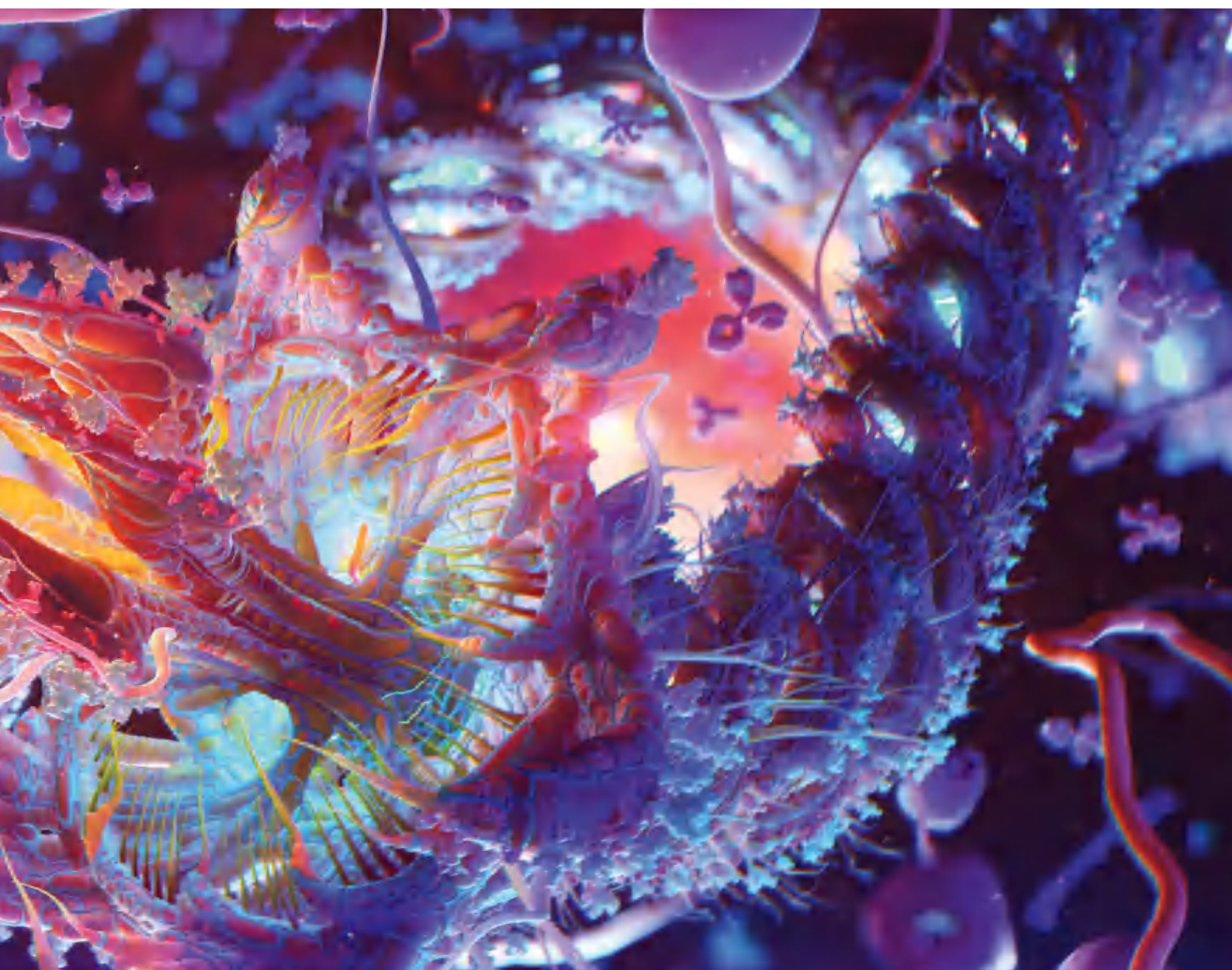
TAKING INSPIRATION
Romi's main influence
behind The Summer
House was his family



3D WORLD VIEW

"I'm really impressed
with Romi's attention
to detail and how he's
utilised SpeedTree,
which is a great tool
for creating trees
and plants."

IAN DEAN
Editor



A LENGTHY TASK
It took Alexey three
months to complete Ebola
Virus, with everything
being modelled by hand



3D WORLD VIEW

"This is a very
powerful image and
clearly a complex one
to produce. The use
of colour is particularly
impressive."

FELICITY BARR
Production editor

SHOWCASE

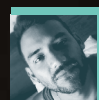
OVERDOING PROPORTIONS
Alex didn't want to create a realistic character with The Terrible Hulkenstein





I overdid the proportions
because I really wanted
a cartoony style

THE TERRIBLE HULKENSTEIN



ARTIST
Alex Ruiz
SOFTWARE ZBrush, 3ds Max,
Photoshop, V-Ray

Having experimented with short 2D animations and modelling characters in motion graphics, Alex Ruiz created The Terrible Hulkenstein as a personal project to help him with a job interview for a gaming company. "This was an old project that I had saved," he explains. "It took me a few hours to sketch but I didn't have time to work on it specifically, so I worked on it for a few hours a day and completed it in two weeks."

Now working as an instructor and modeller at Autodesk, Alex shook up his working methods with this project. "I found several nice reference images to create a draft and I decided to mix things up a bit, just to try something different," he says. "Then I began blocking the torso and the head. I overdid the proportions because I really wanted a cartoony style. At no point did I consider doing it realistically."

"I enjoyed the lighting and shading process in particular," he adds. "This was a really good opportunity to test out different things and see what would make a difference to my illustrations."

FYI To see more of Alex's work visit
www.artstation.com/artist/ruizvfx



3D WORLD VIEW

"The experimentation with lighting and shading has paid off and I really like that Alex overdid the proportions to make it cartoony."

DARREN PHILLIPS
Art editor

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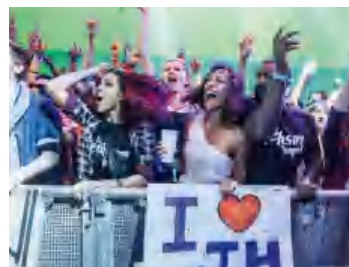
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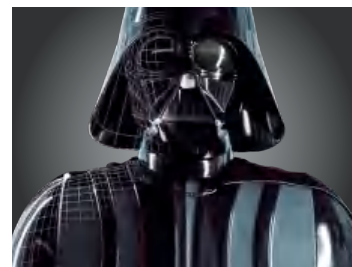
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Pixologic's ZBrush Sculpt-Off featured some of the best – and quickest – 3D artists around



THE BIG ISSUE

CAN SPEED-SCULPTING IMPROVE YOUR ZBRUSH WORKFLOW?

In the wake of September's Pixologic ZBrush Summit, **Julia Sagar** finds out what it takes to be a speed-sculpting champion

Viewers across the globe enjoyed front-row seats to Pixologic's epic three-hour ZBrush Sculpt Off Championship on Friday 25 September, as 24 talented artists battled head-to-head during the second annual Pixologic ZBrush Summit.

Streamed worldwide by Hollywood's Gnomon School of Visual Effects, the Sculpt Off – which was hosted by Joseph Drust and Jessica Dru – saw

Aside from the obvious answer that practise makes perfect, it's a good way to familiarise yourself with ZBrush's vast toolset

Adam Dewhirst, 3D modelling lead and texture artist

sculptor Erick Sosa and senior character and concept artist Furio Tedeschi walk away with champion's belts in the organic modelling and hard-surface categories respectively. We caught up with the pair and a number of sculpting experts after the two-day summit to find out whether speed sculpting really can improve your ZBrush workflow and what you can do to get faster...



For Adam Dewhirst, a 3D modelling lead and texture artist working in the VFX industry in Soho, London, speed-sculpting is particularly effective for boosting efficiency. "Aside from the obvious answer that practise makes perfect, it's a good way to familiarise yourself with ZBrush's vast toolset," he explains. "Each time you need to do something different, you pick up a new brush or a new technique. I'm still learning stuff now."

Adam advises starting with the ZBrush primitives. "It always pays to be able to use what comes straight out of the box," he says. "Look for one or two words of inspiration and get sculpting."

For inspiration, try joining an online community like Facebook's Daily SpitSculpt group. Members are given new themes every day and challenged to create a sculpt in 45 minutes that's then critiqued by participants.

Music can also get the creative juices flowing. "I listen to music that relates to the subject matter," says Erick Sosa. "For example if I'm sculpting Batman, I'll listen to a few Batman soundtrack tracks. That helps tremendously."



Erick is a traditional sculptor who started using ZBrush only a few years ago. He counts Kotobukiya, DC Collectibles and Marvel among his clients, and says that the key to sculpting is a strong set of drawing skills. "I begin with a simple sketch showing the basic idea of what I want to sculpt and then move directly into sculpting. I start with a DynaMesh sphere, focus on my overall silhouette from every angle, and go to town until I refine to a point that it looks decent."



"DynaMesh helps in speeding up the process," agrees hard surface

champion Furio Tedeschi, who's currently working on third-person shooter game Mass Effect: Andromeda at BioWare Montreal. "I make sure my big forms are working before moving onto details – and using IMM brushes will also help speed things up, but don't rely on them for major forms."

One of the easiest ways to increase your speed while working under pressure is to customise your UI. Make sure the tools you use the most – like brushes and brush settings – are easily accessible. "Keeping your lazy radius, AccuCurve and backface masking close



INDUSTRY INSIDERS

Ideas & advice from the experts



ADAM DEWHIRST

3D modelling lead and texture artist
adamdewhirst.com



MARIA CARRIEDO

3D artist, Psyop
mariacg.com



ERICK SOSA

Traditional and 3D sculptor
prototyppezstudios.com

"To boost detail, I like to cut wrinkles into my model with the Dam_Standard brush. I use Mask Cavity to mask out the deepest ones and then inflate that sucker," says Adam Dewhirst. "It can be a great way to highlight your detail. Creating insert mesh brushes can also save you a lot of time. If you're looking to slap in lots of arms, or maybe scales or tentacles, it can be really helpful, especially at the conceiving phase for quick, rough ideas."

"Always go from big to small," advises Maria. "This applies to everything. Block out big shapes first then smaller ones and detailing. Small details should be your last job. Aside from keeping anatomical reference images close to you, it helps a lot if you keep a skeletal base beneath your sculpt to make sure you're hitting the correct body landmarks, as well as body proportions. While sculpting, make sure you think about how the muscles attach to these bones as well as the body's fatty areas. This will help you a lot in making a human body much more believable and accurate to real life."

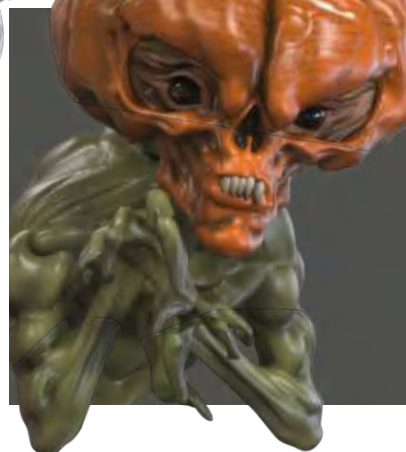
"Learning to draw the human skeletal structure is a must – you can't afford not to know it," warns Erick. "The more acquainted you become with form, shape and anatomy, the better and more successful you'll become at speed-sculpting. You need confidence and confidence comes from knowledge. I would strongly recommend drawing above anything else. Drawing requires more brain effort, however once you have a good set of drawing skills you can sculpt anything in the real world and in any 3D software, especially ZBrush."



This unusual shrimp creature was sculpted by Maria Carriedo



Champions Furio Tedeschi (left) and Erick Sosa (right) with their respective speed-sculpts below



are all good options," says LA-based 3D artist Maria Carriedo. She also recommends setting up hotkeys for your favourite brushes so you can change on the fly.

Currently working at production company Psyop, Maria started speed sculpting when she began learning ZBrush as a way to improve her technique and overall speed, and agrees that it's an effective exercise for improving workflow. For extra control when sculpting, she advises keeping different parts separated by polygroups. "This allows you to mask by polygroups, when you're out of Draw mode, by [Ctrl]+selecting the polygroup." She also recommends using Isolate mode when sculpting parts close to each other – like fingers. "You can do this by [Ctrl]+[Shift]-click on a polygroup or [Ctrl]+[Shift]+Drag over the area to isolate."



"If you have a Wacom tablet, set up your ExpressKeys or Tablet-buttons," adds 3D artist Cirstyn Bech-Yagher. "Like many others, I've mapped my undos to my Scroll-wheel – no more Ctrl+Z for me, I just scroll to undo."

Cirstyn also has a tip that she picked up from Paul Gaboury: "Add your external project folders to Lightbox for easy access – that way you have project items such as textures, alphas and other stuff. Just create a shortcut in your project folder, and drop it into your Zbrush\ZProjects folder. It will load next time ZBrush loads."

Whatever you do, don't be tempted to delve into detail too quickly, warns Adam, suggesting that if you haven't created a good shape in the first place, you're wasting your time. Maria agrees: "Adding too many subdivisions too soon is a mistake. Remember at the beginning you're only blocking out shapes and it's okay to do so with low subdivisions. It's when your silhouette is ready and you want more detail that you can increase subdivisions."

To really get the most out of speed-sculpting, she continues, the key is to focus on the exercise at hand – rather than the final result. "Don't worry about having a finished piece. Speed-sculpting is an easy way to improve technique and speed – it should be seen as practice."

FYI For more on the ZBrush Summit visit www.bit.ly/zbrush-summit

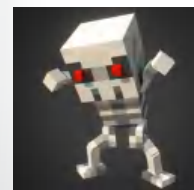
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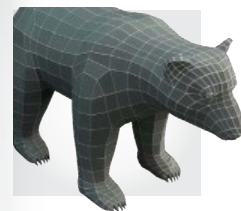
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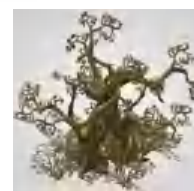
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CREATIVE MARKET

LOW-POLY PLAYGROUND

We're partnering with Creative Market to offer a series of free downloads, continuing with **Matthias Andre's** female base mesh

Here's a great starting point for creating low poly game characters. This female base mesh is the work of modeller Matthias Andre, whose work can be seen on Creative Market.

A platform for digital design content from independent creatives around the world, Creative Market recently launched a 3D art section. It's a great place to sell your content, believes BitGem founder Matthias Andre.

MATTHIAS ANDRE

Matthias is the art director
and co-founder of BitGem.

He is also a content
reviewer for 3docean.net.
[www.creativemarket.com/
bitgem3d](http://www.creativemarket.com/bitgem3d)



"I started uploading to Creative Market as soon as I found out about it," he explains. "I thought it would be a great platform to expose our work to a wider audience."

BitGem, he explains, is a small team working on building a high quality, style consistent and comprehensive low poly model inventory for game developers looking to kick start a new project. "It got started about five years ago now because I wanted to free myself to work on the projects that I really wanted to work on. It was a hard few years but I eventually managed to build a large enough portfolio to quit my day job. From then on I could put more time into building a more complete model portfolio, and BitGem got started"

I think the way Nintendo
designs their games and
characters is brilliant

"We now work together with amazing artists from different corners of the globe to build the BitGem models and I hope that we will one day have the budget to start making our own games too!"

The self-taught 3D and concept artist says his inspirations and influences include Blizzard Entertainment and Warhammer. "I just really love that chunky, hand-painted art style," Matthias enthuses. "I think it's perfect for game development." He's also influenced by older games like

Super Mario, Castlevania, Metroid, Bubble Bobble, Street Fighter and Zelda. "And I think the way Nintendo designs their games and characters is brilliant in many ways. I love retro games and sometimes I experiment with combining 3D models with retro style visuals or making sprite sheets. I also really love Shane Gline's art," he explains.

Software-wise, he doesn't think the tools you use are that important. "It's more about the artistic skill and eye for things that determine the outcome. I happen to use Maya, Photoshop and ZBrush, but I have seen other people achieve similar or better results with other tools."

For this issue, we've partnered with CreativeMarket.com to make Matthias' female and male base meshes available for readers to download – absolutely free! All you have to do is visit our online Vault at www.creativebloq.com/vault/3dw202 and you can download today.

Note that this model is free for personal use only: in order to purchase for commercial use, visit www.bit.ly/cm-female.

FYI To see more of Matthias' work go to creativemarket.com/bitgem3d

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STUDIO PROFILE

HOW INK FINDS STRENGTH THROUGH DIVERSITY

A multi-disciplinary approach to CG makes work at INK tough but rewarding, learns **Tom May**

No one likes to lose their job. But sometimes it can be the best thing that ever happens to you. It certainly worked out well for David Macey, creative director and co-founder of award-winning production studio INK.

"Kamen Sirashki and I were made redundant from a job during the recession, leaving us with no work," he recalls. "Luckily, we were offered one small project to create a motion graphics film. We sunk the last of our savings into a computer that Kamen built, and used that to create the animation. A client saw the finished product and wanted something similar, so we worked on that project. And from then on we just started winning more work and continued to grow."

Today INK is a big name in the industry. This year they've been nominated for two of our own CG Awards – Best CG Commercial Campaign for their work for Land Rover, and Best Arch-Viz Still for their image of The Turnmill in London. David puts their success down to a "commitment to making sure our work feels really polished – that's one of the things we're really good at."

"We care deeply about the quality of our CGI," he explains, "and to achieve that high level of visual fidelity it's important to apply creative thinking – even to the most technical of CGI processes. It's that blend of creativity and technical know-how that really differentiates us."

David also sees great benefits in working across live-action film, animation, digital imagery, photography, print and interactive media – rather than specialising in just one.

DAVID MACEY

David Macey is creative director for award winning studio INK, which he co-founded in 2009 with Kamen Sirashki. He has over 10 years' experience in the CGI industry.
www.weareink.co.uk



ANNIE HAWES

Annie Hawes is a native Londoner who joined INK in 2015 as a project manager. Prior to her time at INK, Annie worked at global art marketplace Artfinder.
www.weareink.co.uk



"We love working in all aspects of CGI," he enthuses. "You can create anything you can think of, so why limit yourself to just one category? Working across a range of different disciplines allows us to try out new things, expand our skill base, and constantly reinvent what it is that we do."

That means they're always busy, of course, and juggling everything can be

tricky. "It's always a challenge to make sure that we're firing on all cylinders with multiple projects in the pipeline, often each with very different demands," says project manager Annie Hawes. "It makes for a really exhilarating work environment, though, and it's always incredibly rewarding to see the final results."

Plus they work to get some pretty cool projects into the bargain.

STUDIO STATISTICS

LOCATION
London

TEAM SIZE
10 permanent,
5-10 freelancers

KNOWN FOR
Digital content
across film, print and
interactive platforms

DIRECTOR'S NAME
David Macey

It's a small, collaborative
working environment;
everybody throws ideas
around and there's a real
sense of being part of a team

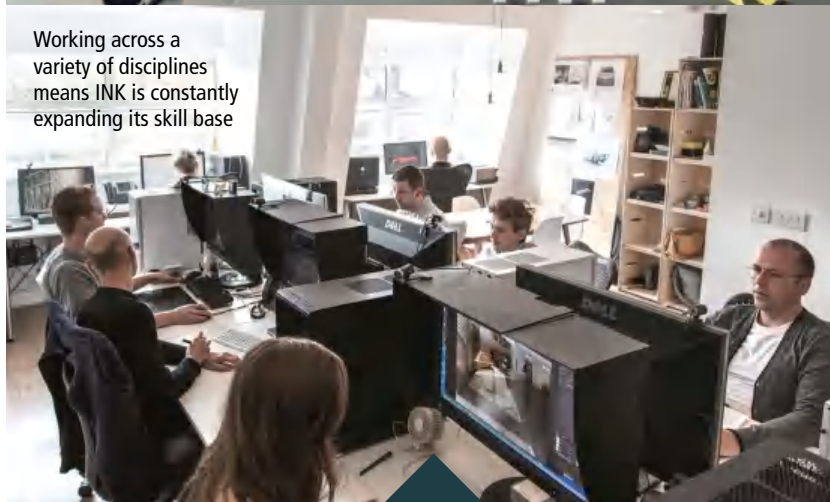
Helen Saunders, retoucher, INK

Recently, for example, INK worked with stadium architects Populous to produce the CGI for Tottenham Hotspur's new stadium press launch.

"We worked closely with the architectural design team at all stages



Working across a variety of disciplines means INK is constantly expanding its skill base



OFFICE BRIEFING

INK is an award-winning production studio that delivers crafted digital content across film, print and interactive platforms. Specialising in the imaginative use of technical and creative direction, the studio is continually experimenting with new methods and technologies and evolving its unique visual language to ensure its work is both relevant and striking. The aim is to take powerful ideas and bring them to life across live-action film, animation, digital imagery, photography, print and interactive media. INK is made up of small teams working on big challenges within industries they're passionate about – automotive, design and branding – producing digital content for clients and audiences.

of the project,” explains Annie, “including sharing early chalk renders to select the composition and lighting of each of the images. We then refined materials and textures through a number of feedback rounds to ensure the images were as faithful as possible to the club’s vision. We also arranged match day shoots at White Hart Lane to collect photographic material for populating the images, which helped us bring the images to life with genuine fans.”

“It’s been a real buzz to be a part of a project with so much significance – not only in terms of the architectural scale of things, but also as a development that’s going to mean so much to so many people for years to come,” explains Annie.

Alongside the rewarding nature of the work, there’s a great atmosphere to the place, adds retoucher Helen Saunders.

“It’s a small, collaborative working environment; everybody throws ideas around, and there’s a real sense of being part of a team. You want to do well at whatever your element of the project is so that everybody else can do theirs to the high standard of INK.”

“Every day is different, which can be a bit unnerving at first, but once you’re in the flow of things it becomes really exciting. You’re constantly learning new things and finding creative solutions to challenges you’ve never faced before, and you learn a lot through practical experience. We work hard, but enjoy what we do, and the sense of camaraderie in the studio is tangible every time we release a new project.”

HELEN SAUNDERS

Helen spent some time teaching and freelancing before joining INK in 2014 as a retouch artist. She specialises in arch-viz and works with clients including Derwent, Clivedale, Populous, and Eric Parry. www.weareink.co.uk



FYI

To learn more about INK and see some examples of their work then visit www.weareink.co.uk

STUDIO PORTFOLIO



LONDON GRAND PRIX

Santander UK and Sidhu & Simon Communications asked INK to turn central London into an adrenaline-fuelled street race. The result is an adventure through an entirely CG city of London, starring Formula 1 World Champions Jenson Button and Lewis Hamilton.



JAGUAR

INK teamed up with FP Creative to unveil Jaguar’s F-TYPE Coupé all-wheel drive at the Los Angeles Auto Show. Taking the stage at the launch event, these carefully crafted CG images were debuted within the media app for both press and fans.



LAND ROVER

INK took Land Rover’s Discovery Sport apart then put it back together in this two-minute slot. This unique film used intricate CGI to break down the individual dimensions, seating, loadspace and convenience features of the SUV.



Image credit: © 2015 Twentieth Century Fox Film Corporation. All rights reserved.

NEW
HOUDINI
SOFTWARE

Popular procedural-based animation tool gets new update

ESCAPE ARTIST

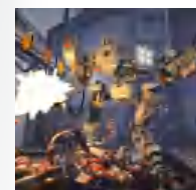
Escape Studios, where Houdini training is already offered on its professional courses, will use the latest version of Houdini on their BA and MA courses starting from next year.

RENDERMAN

RenderMan 20 and RIS shading support is fully integrated into Houdini 15.

BETTER FOR GAME ARTISTS

Houdini 15 enables users to develop their own customisable plug-ins, making it easier for video game artists to use the software in their pipeline. New animation and modelling tools also indicate that Side Effects is shifting focus away from its traditional audience of FX TDs and bringing the procedural paradigm to a wider market.



HOUDINI MAGIC

Houdini can now simulate in the order of 'billions' of particles – distributed across multiple workstations – for incredible water and sand effects. In addition, the new crowd system allows you to layer behaviours, and you can now have agents react to their surroundings. For more info, check out www.sidefx.com.

INDUSTRY INTERVIEW

A GIANT LEAP FOR MPC

The Moving Picture Company brought Ridley Scott's Mars to life in sci-fi blockbuster, *The Martian*

As expected, this year's most anticipated sci-fi flick, *The Martian*, is full to the brim with top-notch special effects. Responsible for the majority of the stunning visuals and delivering over 425 shots with just 24 weeks of post-production, were the artists at MPC, led by VFX supervisor Richard Stammers.

Joining the project during pre-production meant MPC could work closely with Richard to develop the entire look for the martian surface. Richard explains how

NASA Mars mission archives were used for reference: "Ridley Scott and the production designer Arthur Max, had several meetings with NASA which informed them on the details for set design, the configuration of the space shuttles and information on the planet Mars," he explains. "There was also a NASA advisor with us during the shoot to help with any queries."

The team collated and balanced the best of the NASA data to match the shooting location in Jordan. From here, the team turned this original Lawrence of Arabia set into an alien landscape by selectively grading the sky and landscape from blue to bronze and butterscotch.

"To create the colour of the martian sky, the MPC compositing leads developed a sophisticated colour algorithm filter called 'Earth to Mars' which gave us fine control to selectively remove the earthly blue from our shots in a better way than conventional keyers or spill suppression tools. It took around one month to develop ETM," reveals Richard. 2D supervisor Lev Kolobov, created ETM in Nuke and the tool would detect any traces of blue in shots of the Jordan skyline and remove it while preserving the haze detail in the mountains and simultaneously re-grading the reflected skylight.

A whole new world

MPC created a fully CG version of the real-life landscape using high-res photography, adding extra assets such as craters, mountain ranges and rocks to offer a more grandiose Mars-like landscape. With Ridley Scott's direction, the environments team added more drama to the vistas with effects such as the key storm scene: "MPC's teams used Houdini and Flowline for distant views of the approaching storm," says Richard, "The tools did a great job for the dramatic effect Ridley wanted. Further atmospheric effects such as tornadoes and dust devils were also created for some shots, with Houdini simulations combined with multiple practical dust elements in the final composite."

FYI To see more on *The Martian*'s VFX visit www.bit.ly/vfx-martian

RICHARD STAMMERS

VFX supervisor Richard has been working in film for 20 years and has a history of contributing to Ridley Scott's movies, with a portfolio that includes *Robin Hood*, *Prometheus* and the in-development *Alien: Paradise Lost*.
www.bit.ly/stammers



Whirling dust devils dance across the surface of Mars, courtesy of Houdini plus practical dust elements





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Your Plugins	Bilby Plugins	Action1	Action2
viewportmanager	viewportmanager	Continue	Cancel
mmaterialattribs	mmaterialattribs	Continue	Cancel
custattribcontainer	custattribcontainer	Continue	Cancel
mtl	mtl	Continue	Cancel
samplers	samplers	Continue	Cancel

Job Information

File Name: Final Render.3ds
Frame Per Second: 30
Frame Height: 480 px
Frame Width: 640 px
Job Name: Final Product
Select Company Name: Bilby Design Ltd.
Select Project Name: My Render
Preview Frame Number:
Auto Sync To Farm: ☐
Select Cameras to render: Enter Frames for selected cameras eg: 0-230,553,750-1055
Total Cameras: 5

Camera Name	Frame Numbers	Autosync Output Directory
<input checked="" type="checkbox"/> Camera Left Shot	1-15	C:\Final Render Project\renderoutput\left results
<input checked="" type="checkbox"/> Camera Right Shot	16-30,31,33	C:\Final Render Project\renderoutput\right results
<input checked="" type="checkbox"/> Camera Center	41,42,43-45	C:\Final Render Project\renderoutput\center results

Asset Manager Total Assets: 37 Found: 37 Missing: 0

Asset	Asset Location	Status	Action
fp_grasctexture_difus...	C:\Final Render Project\scenes\final\fp_grasctexture_difusce_blue.jpg	Found	Locate
fp_grasctexture_bump...	C:\Final Render Project\scenes\final\fp_grasctexture_bump.jpg	Found	Locate
fp_grasctexture_norm...	C:\Final Render Project\scenes\final\fp_grasctexture_normal.jpg	Found	Locate
color.jpg	C:\Final Render Project\scenes\final\color.jpg	Found	Locate
alpha.png	C:\Final Render Project\scenes\final\alpha.png	Found	Locate
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SHORT CUTS

THERE'S A COMMUTER GLITCH IN THE SYSTEM

Tom Box and **Joe Kinch** explain the process behind their animated short where everyday struggles collide with the frustration of computer glitches

JOE KINCH

Joe graduated from the animation course at Norwich University of the Arts in 2013. His graduating film won him a two-week internship at Blue-Zoo Animation where he's been a character designer, 2D animator and storyboarder.
www.joekinch.co.uk



Commuter Glitch playfully imagines the rut of subway commuting as a raving techno-glitch, but the short isn't just inventive – it's experimental. Here, 30 of Blue-Zoo's animators collaborated to each create a section of the final animation, but without seeing what the others had done. Director, Joe Kinch, says despite this challenging approach there wasn't really a hard point, "maybe the worry and stress of making sure all the animators sections matched up with each other and synced perfectly with the audio. Thank the gods the team nailed the frames

TOM BOX

Co-founder of Blue-Zoo Animation, Tom runs the studio's animated shorts programme, where everyone in the studio is invited to pitch to be director.
www.blue-zoo.co.uk



and locked in the animation without any major flaws." The execution of these sequences is indeed, seamless – or as much as it can be for an animation comprised of on-purpose 'glitches.' Joe designed the entire animation himself – from the subway carriages to the stylised characters, working alongside Tom Box, the short's producer.



VITAL STATISTICS

TEAM

Designer and director
Joe Kinch
Producers
Tom Box and
Damian Hook
Look dev and modelling
David Hunt
Rendering
Charlie Batho
Rigging
Anthony Delliste

SOFTWARE

ZBrush, Photoshop,
Maya, Redshift, After
Effects, Premiere

PRODUCTION TIME

Nine months

What inspired the short's look and feel?

JK: I took a lot of inspiration from a wide range of things. Like this short I found last year called 'BUTTS' by Tyler Hurd. These two stupid characters flying around in the air by the power of their bums. The really funny facial expressions and low poly style worked perfectly. Another short film called 'When you broke my heart' by Charles Lemor. It's a bright and colourful piece about a king longing after his love in a wacky video game inspired world. Both played a big part in how I wanted the piece to look and sound.

How long did it take to produce?

JK: The initial process of sending in my designs for our in-house competition was a little before Christmas 2014. Mid January it really started gaining pace with characters being modelled, and we were able to get more people involved to help it tick along. Seeing Maurice bounce around the train for the first time was so surreal to see. Being attached to this 2D old man for so long and now seeing him move was really exciting.

Talk us through your pipeline

TB: The characters were modelled in ZBrush then imported into Maya for rigging and animation. Each animator animated their short section to a slice of music and passed their final frame onto the next person. Once complete – and all the random poses were stitched together – the whole animation was baked out into an alembic cache to streamline rendering. We used Redshift GPU renderer, as it allowed us to experiment with shaders and advanced lighting systems with less render time than if we had used Arnold or mental ray. In a busy studio it was vital we didn't hog the render farm! A small bit of comping was done in After Effects, then edited together in Premiere.

What was the most impressive technical aspect and how was it achieved using 3D software?

TB: We were implementing Redshift into our studio pipeline over the summer, so this was a great opportunity

to test it with a heavy render. We've built a GPU render farm out of 40 Nvidia GTX 980 graphics cards, which rips through renders at a crazy speed! We tested it out for tight deadlines, as we only had a few days to get the final render complete before we premiered the film at our studio's 15th birthday party. Redshift allowed us to use complex lighting systems in the renders that would've previously taken forever to render, and could've caused us to miss our deadline. Luckily it worked a treat!

What lessons did you learn?

JK: For me as the director not many things went wrong, but as a first time director, learning the different aspects of the short was a great experience – from how it gets animated in Maya and how you make sure the sound quality is on point, to how much you can push a rig. I also learned team management and giving essential, helpful feedback.

FYI Watch the full short online at
www.vimeo.com/138967681

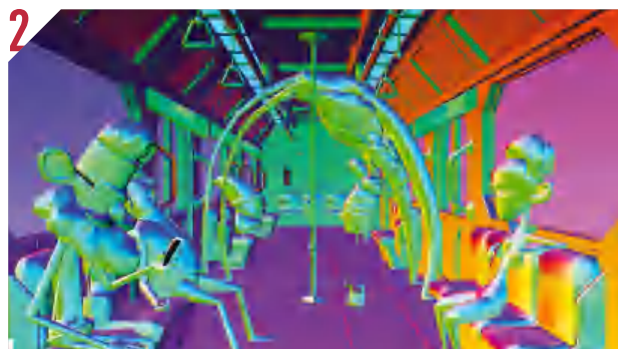
1 Switching from Arnold and mental ray to Redshift allowed us to render 10 times quicker, really boosting the scope of what we could achieve.

2 We used alembic geometry caching to ensure that all animation was locked and untouchable, while keeping the file clean and fast to use.

3 Communication is the key ingredient for any collaborative project. We used Google spreadsheets to make sure everyone knew what to do.

4 Always do a second design. The first may be amazing but just stop and really think about it. Figure out exactly who your character is.

5 As a director, always take others people's ideas into consideration. You may have an overall idea, but stop and reflect with others.



GPU RENDERING WITH REDSHIFT

We had to render the same animation using many different styles, meaning lots of frames to render! We would've run out of resources using a CPU render like Arnold or mental ray. We opted for Redshift, which uses the graphics cards to render on, rather than CPUs. Now we could really push the renders and still render the whole animation in a weekend. It also allowed us to creatively push the visuals and experiment with different advanced shaders that would normally result in too high render times. The render farm we built allowed us to render on over 120,000 GPU cores simultaneously at a fraction of the cost of a normal render farm.

6 Animatics really are crucial and there is nothing better than a well timed, clean and clear animatic to get your entire team on the same page.

7 Embrace problems and turn them into benefits. We wanted lots of people working on one short with as much creative freedom as possible, so designed the project around that.



*Fabric Engine 2
download release*

CANVAS OF POSSIBILITIES

Fabric Engine v2.0 features Canvas, a visual programming system that enables anyone to build high performance tools for VFX, games and VR. "The visual programming system is completely portable between different applications and allows users of all levels to get the most out of the hardware they're using," says Fabric CEO Paul Doyle.



VISUAL ADVANTAGE

Psyop CTO Jean François Panisset said, "We used Fabric to develop a custom hair simulation system and are planning to enhance this tool to take advantage of the visual programming, providing a node-based graph allowing our artists to reconfigure the system to suit the needs of the project they're working on."

A NEW LANGUAGE

One of the key innovations with Fabric 2.0 and Canvas is the KL language developed by the Fabric team. This is what allows developers of all levels to build high performance tools on top of the software. Canvas now makes it possible to leverage KL without having to write a line of code!

INDUSTRY NEWS

VAULT INTO THE MOCAP REVOLUTION AT HOME

The Mocap Vaults' founder **Oliver Hollis-Leick** reveals why he is raising the bar for motion capture use

Founded by Oliver Hollis-Leick – a veteran of motion capture with 13 years' experience – The Mocap Vaults offers motion capture training through live hands-on workshops and online resources. The company aims to deliver an understanding of the nuances of performing and working on

In motion capture, you have a bare warehouse-like set with no props, no costumes... sometimes no other actors

production shoots in a mocap setting; the veteran actor feels that the specific techniques demanded by mocap tools need to be taught.

OLIVER HOLLIS-LEICK

Founder of The Mocap Vaults, Oliver has worked on over 80 video game and movie titles, with roles in Iron Man 2, Harry Potter and the Order of the Phoenix and Godzilla, among many others.
www.themocapvaults.com



Any hesitation, tension or discomfort is immediately read by mocap technology, explains Oliver. "The hardest thing about motion capture is the rawness of it. In motion capture, you have a bare warehouse-like set with no props, no costumes... sometimes you have no other actors in the room and you don't necessarily even know where the camera is." This means it can be difficult for all involved to imagine the

final scene – having nothing visual to work with can be very challenging.

The Mocap Vaults aims to help by training people in how to excel at working in motion capture by creating free online content that people can absorb at home, as well as training sessions, workshops and events. Also, Oliver wants to encourage greater use of mocap in your own projects. "With tools like iPi Soft's motion capture software, people have the opportunity to create motion capture content on a small budget. We want to see more and more of this independent content. The onset of virtual and augmented reality means that more and more motion capture will be required. It's very exciting to see how indie filmmakers and game developers are making use of mocap technology for use in this new frontier."

Rules of engagement

Just as the DSLR changed filmmaking, iPi Soft's tools mean you can do the previously unthinkable. "You don't have to hire out an expensive studio," says Oliver, "You can try something, watch it back, try again and eventually hone the performance. It's incredibly useful in the classes I teach." This means it's essential for people who want to enter the industry to have at least a basic understanding of the role mocap plays, and how to get the best out of your mocap actor. "Every medium has its own rules," Oliver adds. "Motion capture is no different. Traditionally-trained actors tend to come off quite wooden in motion capture because they're so used to focusing the fullness of their experience into their face alone."

FYI The Mocap Vaults offers free online tutorials at the website www.themocapvaults.com

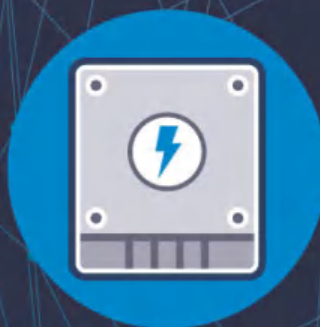


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The latest entry in the Guitar Hero franchise has you perform in front of hundreds of motion captured fans

INDUSTRY INTERVIEW

HOLDING OUT FOR A HERO

Alice Pattillo discovers how FreeStyleGames brought an authentic concert experience to games consoles



JAMIE JACKSON

Creative director and co-studio head. Prior to founding FreeStyle, Jamie worked at Codemasters, on such titles as Colin McRae Rally 2.



"The Guitar Hero franchise, a game that lets you live out your rock star dreams, has been re-worked with a unique use of mocap. British studio FreeStyle has taken the step of ditching traditional game CG; in fact, there's no animation in the reboot reveals creative director and co-studio head, Jamie Jackson. "We wanted to make you feel like a rock star and so we've created these live-action environments for you to live out that fantasy. By turning the camera around and changing your point of view, we're delivering a live-action experience that takes you on the emotional rollercoaster of getting up on stage."

FreeStyle travelled the world to experience various festivals, collecting a vast amount of detailed research material.

"We ate the food and checked out the ancillary parts, admits producer, Joel Davey. "We wanted to make sure that every layer of detail we added had been considered and was authentic. After we gathered our reference we came back to our studio and started to build out our ideas. We decided on two locations for our festivals: the English countryside and an American city."

JOEL DAVEY

Producer Joel has a degree in Film and TV from Warwick University. He joined FreeStyle straight after graduating.



GARETH MORRISON

Assistant art director Gareth has worked on both DJ Hero and DJ Hero 2. He previously worked at Codemasters with Jamie Jackson.



From here, assistant art director Gareth Morrison, explains how they created a map of each festival. "These maps then informed us on what we were going to see from each of our stages when designing the stage concept from the player's point of view."

The secret to their ultra-realistic concert capture is mocap. Working out a narrative path of each song, mapping where the guitarist would be on the stage and using the tracks as blueprints for the action, the team's camera operator then

donned the mocap suit. Joel explains, "This raw data was then transferred to a robotic camera we referred to as Penelope [a one-ton robot that traversed a 30-foot track at high speeds]. With the singularity of human motion rolled into a mechanically reproducible form, we were able to rehearse our bands in controlled conditions."

Guitar Hero Live required a large cast of festival-goers to fill its realistic setting. Hiring up to 500 extras per shoot, they would cheer or boo a real-life band. "At one point, we were shooting in the dead of winter. With sleet and snow falling outside the studio doors, there was this small sea of festival-goers, all decked out in summer gear," Joel recalls. "We also had to develop a means of multiplying our crowd members on a biblical scale. Our fix came in the form of a lorry-load of green screen curtain, with some major help from our good friends at Framestore."

Let there be rock

Another testing attribute was the necessity of covering both bad players and great players. "We had to determine a method of shooting long, dynamic-yet-repeatable shots that felt lifelike," says Joel. "Achieving that would enable us to switch between positive and negative versions smoothly without weird camera cuts breaking the experience when the player's game slips. No human being is capable of delivering two perfectly identical four-minute hand-held takes – let alone the real number required to get the action itself right. To create the end result we fused together a number of techniques."

FYI For more on FreeStyleGames' portfolio and work, check out www.freestylegames.com

INSPIRING
CG ARTISTS

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IN FOCUS

MAKING DARTH VADER

Tom Isaksen reveals how he created this hangar full of characters from the Galactic Empire

When creating a scene from his favourite cinematic universe, character artist Tom Isaksen was careful to pay close attention to detail. Aware that Star Wars is important to fans around the world – as well as himself – the talented animator and director conducted in-depth research online to ensure everything was perfect.

Having made 3D characters for the past 15 years, Tom found the modelling in 3ds Max and ZBrush relatively straightforward, “The biggest challenge was finding references to make everything as close to the movies as possible,” he explains. It was only when it came to the location itself that Tom ran into problems. “The lighting

is unique in the sense that there are no fake light sources in the scene,” he reveals. “All light comes from the entire hangar modelled around the characters.”

Despite being filled with an array of background characters, droids and vehicles, it was the lure of creating Darth Vader himself that fuelled Tom while he completed the project. “In my opinion Darth Vader is one of the best villains of all time,” he says. “Technically he has a great combination of cloth and hard surface elements that make an interesting 3D model.” By using both ZBrush and Marvelous Designer, Tom was able to create a character as detailed as the films themselves.

FYI For more art by Tom Isaksen go to www.characterink.com

VITAL STATISTICS

SOFTWARE
3ds Max, ZBrush,
Marvelous Designer,
Octane Render

COUNTRY
France

PRODUCTION TIME
Two months

ARTIST PROFILE

With a Masters in Computer Animation from NCCA Bournemouth University, Tom has designed characters for huge games, including the Hitman series. www.bit.ly/202-vader



Darth Vader is one of the best villains of all time. Technically he has a great combination of cloth and hard surface elements

1 SETTING THE SCENE

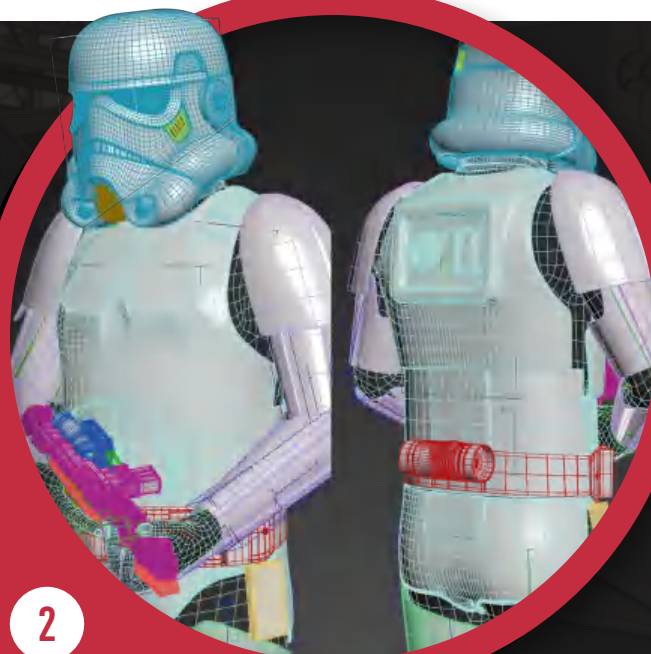
In order to get the right lighting and reflections on the characters, I first needed to model the entire set – from walls, to scaffolding and TIE Bombers. I was going for a movie set look rather than super realism, to match the feel of the movies. Having the entire set also gives you lots of freedom to play around with different camera angles later in the project.



2 CREATING THE SECONDARY CHARACTERS

Modelling the crew, including stormtroopers, imperial gunners and officers took a long time. For the background officers, I initially used basic face scans as placeholders, but since they were largely out of view I decided not to spend any time remodelling.

2



3

3 CREATING DARTH VADER

Modelling the helmet was tricky, but everything else was pretty straightforward. To get the shaders and textures right I created an HDR map of my scene to do quick render tests, without having to render everything. Substance Designer was used to create a fine layer of grease and scratches on the surface of the armour.

4

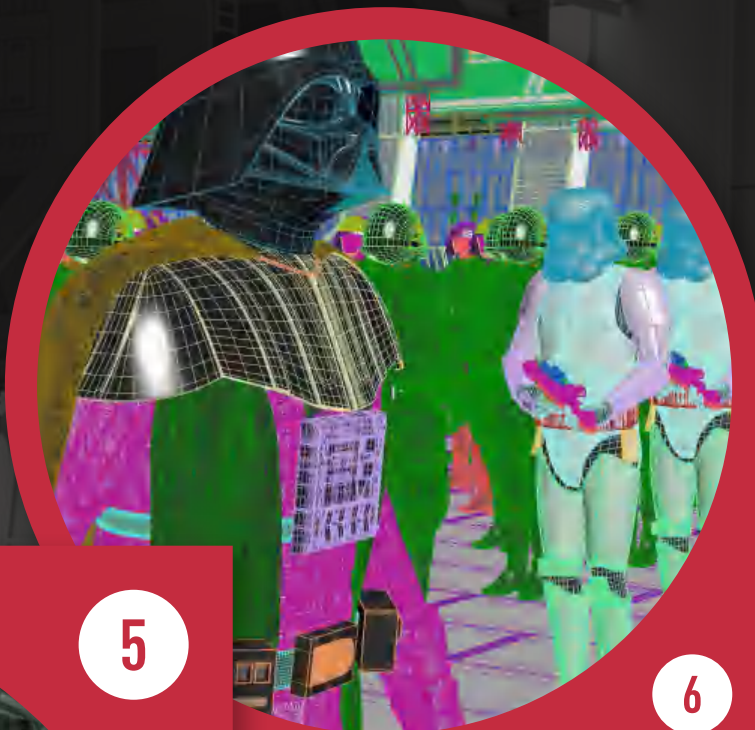
BACKGROUND POSES
Everything is based on instancing to keep video memory use low; as Octane Render is a GPU renderer it depends a lot on this. But I created the instances so I could easily tweak poses here and there, ensuring they don't all look identical.

4



5 ADDING THE FINE DETAILS

I made small tweaks here and there, just to make the image more fun to explore. I added Viper probe droid and mouse drone, and used Substance Designer to create multiple texture sets for the stormtroopers with a bit of dirt and scratches. I started to do render tests of the full scene and made small adjustments to shaders in order to get the right reflection and colour.



6 FINDING THE FRAME

Finding the right camera angle was tricky. I spent a few days just experimenting with this, adjusting FOV, POV and moving characters and props around to get it just right. I tweaked where the characters were looking, and made lots of small adjustments to the pose of Darth Vader. For composition I was keeping the rule of thirds in mind. Finally, I tweaked the strength of the lights in the hangar, while adjusting exposure values on the camera.



5

6

7

7 FINAL RENDER

Depth blur ended up being one of the biggest factors to getting the film look I was going for just right. I also really wanted to put emphasis on Darth Vader, even though it meant a lot of my hard work would be blurred. Render time for a 5K render was about five hours with 2xGeForce GTX Titan.





EXPERT PANEL



Cirstyn Bech-Yagher

Cirstyn is a freelance CG artist and educator, with over 15 years' experience in 3D. Her clients include AMD and DAZ 3D. www.northern-studios.com



Anita Brown

Anita provides a 3D visualisation service to the interior design and event design industries. She's also a Maxwell Render certified expert trainer. anitabrowndesignstudio.com



Syawish Rehman

Syawish is a VFX and motion graphics artist based in Punjab, Pakistan. He's been in this field for more than nine years, mostly freelance. www.bit.ly/syawish-rehman



Rob Redman

Rob runs a 3D animation and VFX studio, working for clients ranging from governments to rock stars. He's also an industry commentator and trainer. www.pariahstudios.co.uk



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ARTIST

Q&A

Your software queries solved by our CG experts



How can you make complex meshes inside Cinema 4D?

Amisha Kerr, Australia



Rob replies



Most geometry in 3D becomes complex at some point and there are a multitude of methods for dealing with the issue. The problem itself can come in different forms, from simple viewport performance drop-off to scene management. An object made from many parts can become tricky to navigate and the Object Manager can become a mess. Of course there are tools for this. You can assign different objects to layers, which you can collapse, hide or lock. There's always the Solo button which can really help the viewport speed as well as

This is a popular modelling
method for creating organic
objects such as characters

making it easy to find what you're looking for, or make selections.

Keeping things procedural can really help too. Not only do you get to work with a primitive object for as long as possible, which is always wise, but you can still edit them at point level, using deformers. The Correction Deformer is especially useful for changing primitives, while keeping them parametric.

However the best way of building denser, more complex meshes, when you really need point/edge/polygon-level control, along with the ability to employ

EXPERT TIP

Ctrl, click and drag

The most common tools for generating new geometry on your mesh are the Extrude tools but to use the main extrude there is no need to access any menu. Simply make your poly selection, and hold down [Ctrl] while clicking and dragging to extrude it along its surface normal.



STEP-BY-STEP BUILD A LOW POLY JUG THAT RENDERS SMOOTHLY

ONE PLAN AHEAD

It's really important when modelling for subdivision surfaces that you keep your polygons four-sided wherever you can. This helps to ensure your underlying mesh has as few smoothing artifacts as possible. You will find if you have points where five or more edges meet, that you can get odd, star-shaped pinching. If you can't avoid it try hiding it by using the Spin Edges command to move it out of the way.

TWO GET YOUR LOW POLY MESH SORTED

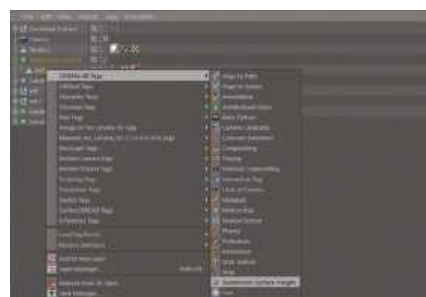
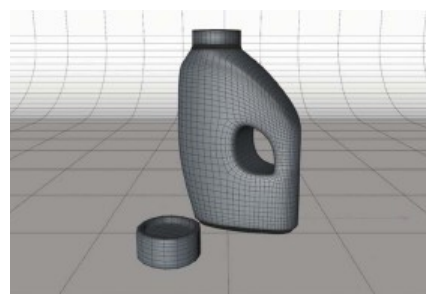
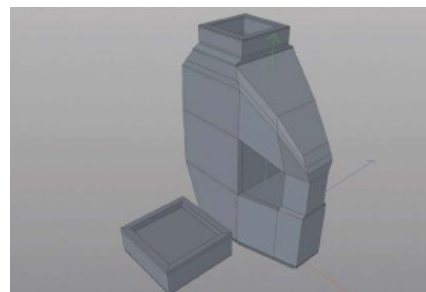
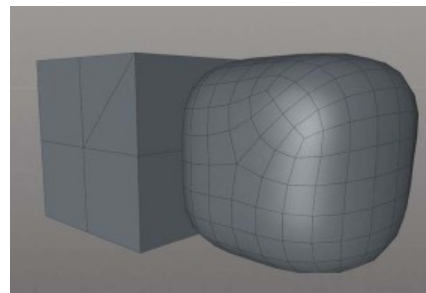
Here you can see that the meshes for my jug and lid are finished but are very blocky and the polygon count is as low as possible. This makes the model light on memory and hard drive space, so easy to share and store. What's more important is the placement of edges: where the edges are closer together, these areas will be sharper than others, which will flow in a softer way.

THREE SMOOTHING LEVELS

Next, add a Subdivision Surface object to the scene and make your model a child of it. If you put your meshes under a null you can smooth multiple objects in one Subdivision Surface object. However that prevents you using different smoothing levels for different meshes, which can be handy. In the Subdivision Attributes you can adjust the amount of smoothing for both your editor view and render view.

FOUR SUBDIVISION WEIGHTS

There is one cool little feature in C4D that enables you to keep your poly count low and that is the Subdivision Weight tool – another tool that needs no menu access. If you want to tighten up the edges of a poly selection, highlight it then hold down the Period key and drag to the right. You will see the mesh tighten and a new weight tag is applied to the object, which lets you access the weights later if needed.



all the great modelling tools like bevels and extrudes, is to work with subdivision surfaces. You could use XRefs but in my experience individual artists rarely bother with them, so let's look at a more real-world option.

Subdivision surfaces essentially take the angles between the polygons of the child object and create curved meshes, based on the smoothest route between the edges. This is an iterative process, which creates smoother and smoother meshes – for example, if you subdivide a cube enough times you'll end up with a sphere. You can also alter the shape of the subdivided form by adding extra geometry to the base mesh (or 'cage'), using edge loops and knife cuts.

This is a very popular modelling method for artists creating organic objects such as characters, as it lets them work on a relatively low resolution model but switch on various levels of smoothing. While great for modelling, this also means the memory overheads are low and interchange with other applications or game engines is far easier.

On top of these benefits you also have the ability to display your model in a variety of ways, so you could view the smoothed mesh while working on the low-poly cage, which can be useful when controlling topology, while UVing a lower-density mesh is always easier, so working with subdivision surface models can save hours once the modelling is complete.



ARTIST Q&A



If you see the Play icon, use the link

EXPERT TIP

Topology matters!

If you use Marvelous Designer to create your conforming content, run your item through ZBrush's ZRemesher or a similar function in another program – even though Marvelous Designer ships with quads now, the converted-from-tris quads form a mesh full of patches which can be hard to cut, morph or remap.

Using Marvelous Designer in conjunction with Daz Studio helped Cirstyn produce this stunning figure



How can I do basic conformer rigging in Daz Studio with the Figure Setup tool?

Mike Parr, US



Cirstyn replies



Even though the Poser and Daz Studio (DS) communities have been around for years, one of the most commonly asked questions is still, 'How do I rig conforming clothing for my figure?' Depending on your figure and the software you're using, you'll get answers ranging from using a donor-figure (taking and adapting another figure's rigging to help you conform your own clothing), to using the Daz Studio Transfer Utility, an auto-rigger for most of Daz's human figures.

Using DS and the new Genesis 3 Female as an example, we'll take a basic look at the Figure Setup tool instead. If you enjoy modelling, especially if you want to get into content creation, it pays to know how to set up your own bones, even if it is with a little help from a donor. The workflow is a bit more taxing, but spend a little time and elbow grease, and you'll be able to rig your own items in no time.

Unlike the Transfer Utility, using the Figure Setup tool demands that you use a 'cut' item, which means you have cut your mesh and name the cuts to match the groups, and thereby bones of the figure you want to conform your item to. While you're at it, also create Material (surface) groups for your textures.

The thing to remember is that your groups need to be sharp and clean cut, so you won't get issues with bones reacting to the one polygon belonging to a hip, but which ended up being assigned to the neck. Once you've cut and named your item, load the figure you modelled for in DS, open the Figure Setup tools, remove the donor bones you don't need, and add your own geometry before tweaking your item's bones, and fit to figure.

STEP-BY-STEP USING THE FIGURE SETUP TOOL IN DAZ STUDIO

ONE CUT YOUR FIGURE

When you're done modelling, cut your figure's groups to match the figure you're conforming your item to. You can do this in DS, your modeller or UV Mapper. Ensure your cuts are clean, and match the target figure in group and name; if your target-figure has a group named lThighBend, ensure you have a cut group named lThighBend as well.

TWO LOAD YOUR DONOR FIGURE

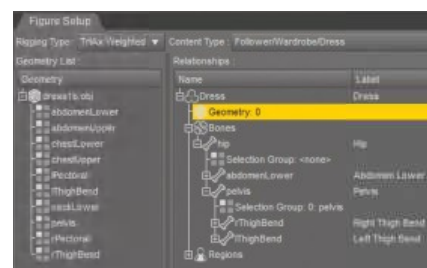
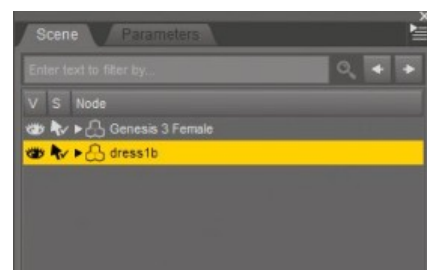
Start DS. Load and select the figure you created the item for. We're using the free Genesis 3 Female, which we'll use as a donor. Go to Windows>Panels>Figure Setup. Select Copy from Selected figure in the upper right menu. This loads all the figure's bones into the Setup tool. Click Remove Geometry in order to make room for your figure's geometry.

THREE CLEAN YOUR DONOR RIG

Before you add your object, clean the rig for superfluous bones. The rule of thumb when creating conforming items is to never delete a bone connected to geometry and subsequent bone. For example, if you have a short dress you can delete the foot and the toes but not a shin bone connected to a thigh bone with mesh attached.

FOUR ADD YOUR FIGURE AND TWEAK

Click Add Geometry and add your item. Drag it into the Relationships pane, rename figure and label from G3Female to G3Dress. Because of the cut groups, the bones will match. Pick Follower/dress from the content-type dropdown, check apply SubD, and press Create. Fit to G3Female and you're done with your basic rig. Tweak your bones, add morphs, and you're done!





EXPERT TIP

It's all about the RAM!

If only a small portion of the rug will be visible in the final render use the Level of Detail parameter to render more blades near the camera and gradually less blades as the distance from the camera increases, thereby saving that precious RAM.

A densely textured rug created using Maxwell Grass

SKETCHUP | MAXWELL RENDER

How can I create a fur rug using the SketchUp plug-in for Maxwell Render?

Colin Rogers, UK



Anita replies

The SketchUp plug-in for Maxwell Render offers a whole host of functions that enable the user to create a wide range of textured materials. If you're specifically interested in creating a densely textured rug then Maxwell Grass is your friend. This feature (known as a Maxwell Render extension) can be accessed directly

Maxwell Grass basically generates geometry for selected groups in SketchUp once the scene has been exported to Maxwell Render

within the SketchUp interface via the SketchUp plug-in for Maxwell Render. Officially it's called Maxwell Grass but don't let the name throw you: this extension has such a high number of unique parameters that it's possible to create textures that are ideal not only for grass textures, but also carpet and rugs.

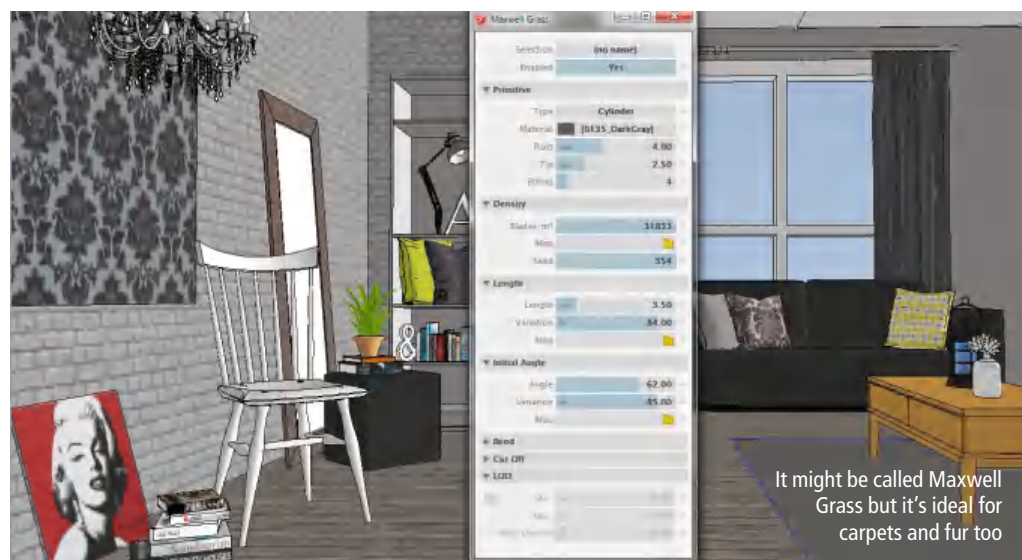
Maxwell Grass basically generates geometry for selected groups in SketchUp once the scene has been exported to Maxwell Render. To get started, select the group and then click on the Maxwell Grass icon in the SketchUp toolbar. A new window will open with a range of settings. Here you

have the ability to specify the parameters of how you'd like the grass (or in this instance fur) to appear. The Primitive setting is the first step in specifying the colour, shape and thickness of the blades, including the number of points (segments). In my scene I chose the Cylinder setting and opted for quite thick individual strands. Just remember that RAM usage will increase depending on which type of Primitive you choose and the associated number of points.

The density and length of the blades can be specified according to preference and a very useful randomiser can be

used to vary the length according to the percentage input. The Maxwell Grass extension also includes Bend parameters. These control the bending of each strand of blade, at what length it starts bending, the angle it bends, and the bending radius (with randomisers for each). The Bend parameters are invaluable when trying to recreate the behaviour of densely textured fur rugs and provide a high level of accuracy and realism.

Explore additional functionality of Maxwell Grass by using Maxwell Studio to add gradient and texture maps to further refine and enhance.



It might be called Maxwell Grass but it's ideal for carpets and fur too



How do I make a flowing cloth simulation?

Sarah Adams, UK



Syawish replies



47 Ronin's visual effects were accomplished in Maya by MPC, which did an incredible job.

One of the most impressive effects was the cloth simulations where the Tenegu Monks (those weird alien-like creatures in that cave) move with extreme speed and leave behind an amazing trail of cloth. I was fascinated with it ever since I first saw the movie, so for this question I decided to recreate it using Maya, just like MPC.

The first thing to do is shoot some footage – this is captured with a simple DSLR camera. My friend runs around in a horseshoe pattern. Next, I take some time to prepare the footage to be imported into Autodesk Maya in order to simulate the cloth using nCloth. I then texture and render it and use After Effects to composite it.

Cloth simulation is a tricky thing but Autodesk Maya's nCloth makes it incredibly simple and easy to use. I'm personally quite impressed by it and don't really like any other software's built-in cloth systems. The best thing is that you don't have to pay a single additional dime to get this amazing feature.

if you think about it. You could always use another application – each one has some sort of cloth simulation system but mostly they're pretty poor.

For this tutorial I apply the super-speed effect before the animation because I have to use the footage to animate the cloth growing relative to the

Cloth simulation is a tricky thing but Autodesk Maya's nCloth makes it incredibly simple and easy to use. I'm quite impressed by it and don't really like any other built-in cloth systems

The nMesh in Maya doesn't really lose its original functionality and will still have the attributes of the original mesh. Also the UVs won't get messed up. Other than that the animation gets really organic and procedural; it's all pretty amazing

character. This effect isn't very difficult, so you don't have to follow this tutorial step-by-step; you can make it with a lot of leeway.

Now, on the opposite page you can follow along with how I used nCloth...

STEP-BY-STEP CREATE A FLOWING, MAGICAL CLOTH TRAIL



ONE PREPARING THE FOOTAGE

Let's start by preparing the footage for use. The only thing you have to do to stay true to the real effect is give it a super-speed look. Simply remap the timing of the footage, keeping it real-time near the end and the beginning to give a realistic feel as the character is accelerating to super-speed.



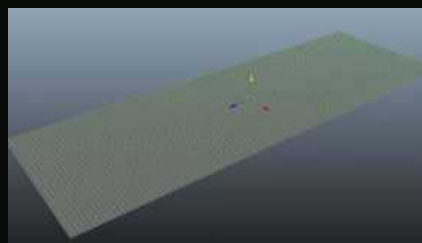
TWO SUPER-SPEED EFFECT

Add keyframes at the very beginning and where you want the character to hit full speed. Do the same at the end in reverse by adding a keyframe near the end where the character should start slowing down to the very end. Now you should have four keys. Select the last two keys and move them closer to the first two keyframes. Add Motion Blur for realism.



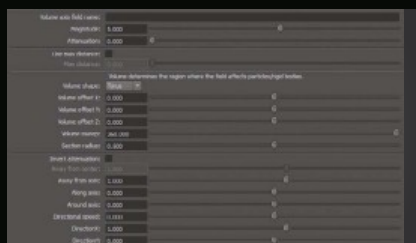
THREE ADDING MOTION BLUR

There are third-party tools for this like The Foundry's Kronos (it uses the GPU as well so it's faster). If you're using Adobe After Effects CC or higher, you can also use the built-in Real Smart Motion Blur tool. Simply add the effect after you've remapped the footage. Usually Shutter speed is at 180, but crank it up as high as you want, I used a number as high as 1280.



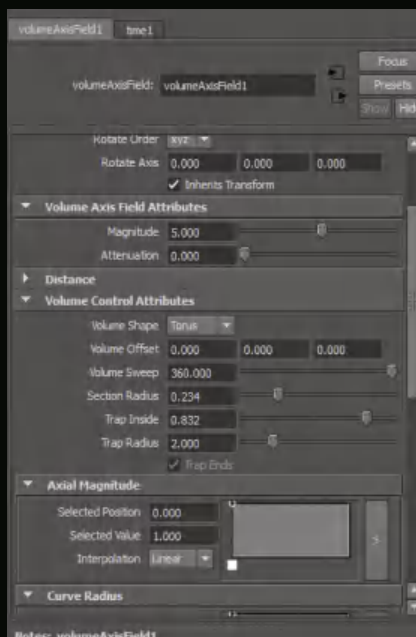
FOUR CLOTH SIMULATION

Now in your 3D application, create a plane. Make sure the polygon are squares even if the plane isn't a square – square polygons create a better simulation. Next you have to turn the plane into a cloth mesh so it looks like cloth as it appears behind your character. Go to nDynamic>nMesh>Make nCloth. Now your plane is an nCloth object.



FIVE BRINGING LIFE TO THE CLOTH

Let's make the nCloth object into cloth with wrinkles and other deformations. Go to nDynamics>Fields>Volume Axis. This is a container that will interact with your nCloth object. Adding a Volume Field will give the cloth the shape you want (elliptical in this case, so I changed the Volume field to a torus.)



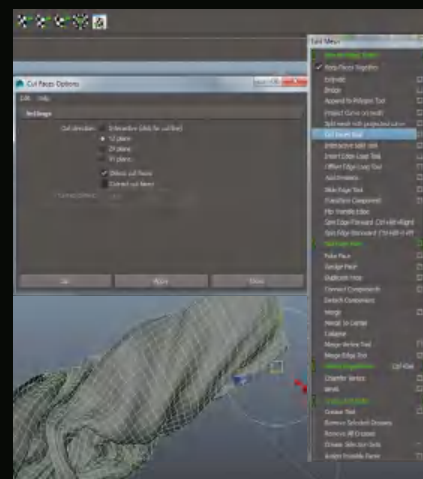
SIX GIVING THE SHAPE

In the Attribute settings of the field, turn on the Trap Inside setting, this will keep your cloth inside the torus. Don't crank the setting to the highest level, keep it at about 80 per cent, otherwise the cloth will look flat on the sides. To help the cloth move add a vortex; this will provide a force rotating the cloth inside the torus to make an orbital rotation effect.



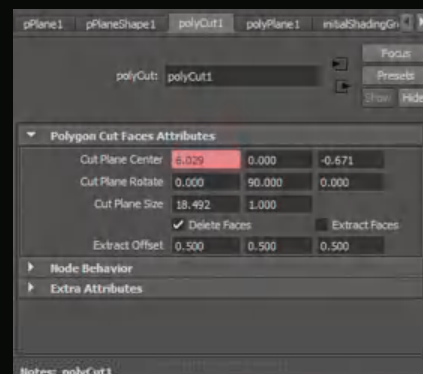
SEVEN SETTING INITIAL CONDITIONS

Once you have a frame where the cloth looks good, stop the animation and make it the initial conditions of the simulation – when you start the simulation again, it will begin from this point. Now you have to cut the cloth and grow it as your character moves. Set your footage up on a plane – you'll use the character's movements to grow the cloth accordingly.



EIGHT CUTTING THE CLOTH

Go to Polygon>Edit Mesh>Cut Faces tool and open its options. Set up the cut direction to be a plane (YZ in my case). Check the Delete Cut Faces option. Now you'll see that your mesh is cut in a very straight fashion. If you open the attributes of your mesh and go to the PolyCut1 you'll find that the plane along which it's cut can be animated.



NINE GROWING THE CLOTH

Now that you have a cut, change the cut plane's position so that all of your cloth disappears. This is your first frame. Now you have to animate it in a way that it grows as your character moves at super-speed. If your cloth isn't long enough to cover all of your character's path, duplicate the cloth and animate it so the second cloth starts appearing right after the first.



TEN FINAL STEP

This is more or less it. To get closure, I also animated the cloth to fall. All you have to do it simulate the cloth with gravity again, after you've cut it to fall, but change the start frame to after it's finished growing. That's how it was done in the movie.



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ARTIST PROFILE

Matthew Trevelyan Johns

Matthew got his break in video games in 2008. His career has spanned seven years across two studios and he currently works as a senior artist at Cloud Imperium Games.

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ANATOMY

ways to improve your

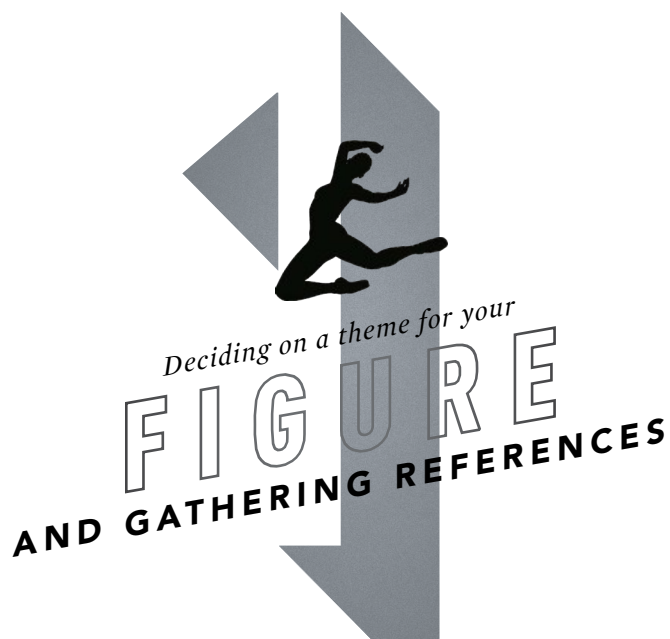
SCULPTING IN ZBRUSH

Over the course of this feature we'll look at the various stages involved when sculpting a figure in a dynamic pose. I'll cover a wide range of topics, from gathering and organising appropriate reference, to understanding the mechanics of movement. With helpful images and useful tips and tricks along the way this tutorial aims to introduce some key features of ZBrush, as well as motivating you to enjoy creating your own dynamic anatomy models. In the online Vault is my final ZBrush model and high-res art.



FEATURE

Anatomy sculpting in ZBrush



www.creativebloq.com/vault/3dw202



The Chinese philosopher Laozi once said that "A journey of a thousand miles begins with a single step." The same is true of any challenging venture and in the case of an art project, gathering reference materials should definitely be the first step taken. With our anatomy study in mind, collecting the reference is just as critical as the eventual sculpting and rendering – and the task will be considerably more difficult without it.

When working on a personal project an important part of the referencing stage is to choose a theme that you are enthusiastic and motivated enough about to pursue. To create a project that you are truly passionate about – not only finishing but also doing well – then a personal interest in the subject matter itself is essential. The idea of dynamic anatomy and motion is something I find particularly challenging and interesting to work with when studying anatomy. So rather than choosing a static pose for this project, I focus on dance as my subject, and in particular, ballet.

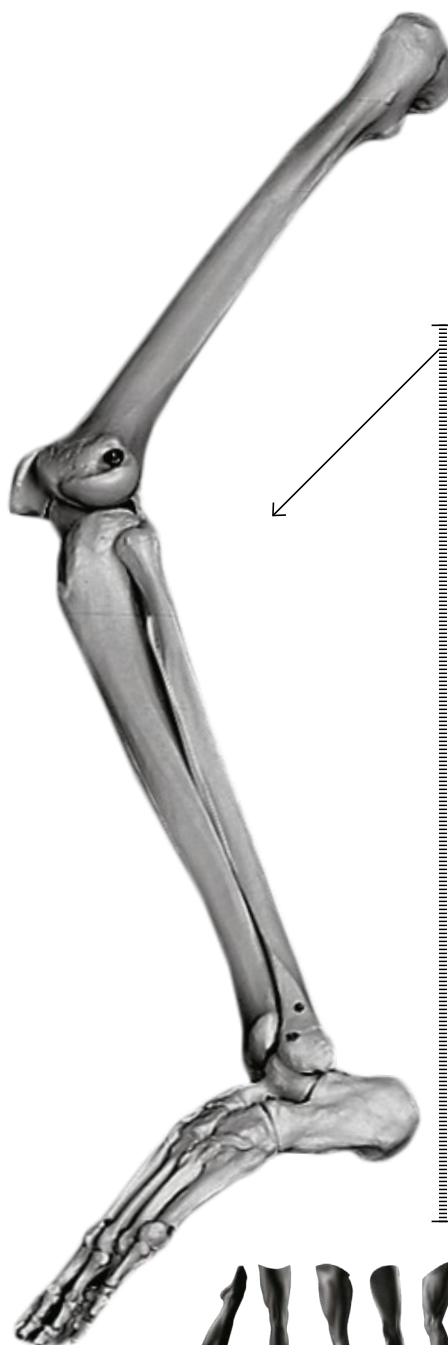
Attempting to sculpt a figure that is in a dynamic pose is incredibly challenging and so choosing the right anatomy reference is essential. The most important thing to look for in anatomy reference images is lighting. I try to search for images where the subject is lit from a single, dominant light source. This type of lighting will produce the clearest patterns of light and shadow and will allow me to understand the undulating surfaces of the subject's body much more easily.

Having chosen a theme, collected and studied the best reference images, and finally chosen an interesting and dynamic pose I'd like to sculpt, the next step is to fine tune a base mesh for the requirements of this project.

PRESENTING YOUR REFERENCE

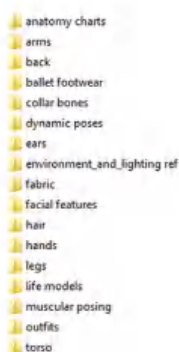
By knowing what kinds of reference will be the most useful I can build up a large collection from various sources. I'll also create mood boards that focus on just one area, like the musculature of the leg for example, and consolidate the best references I have.

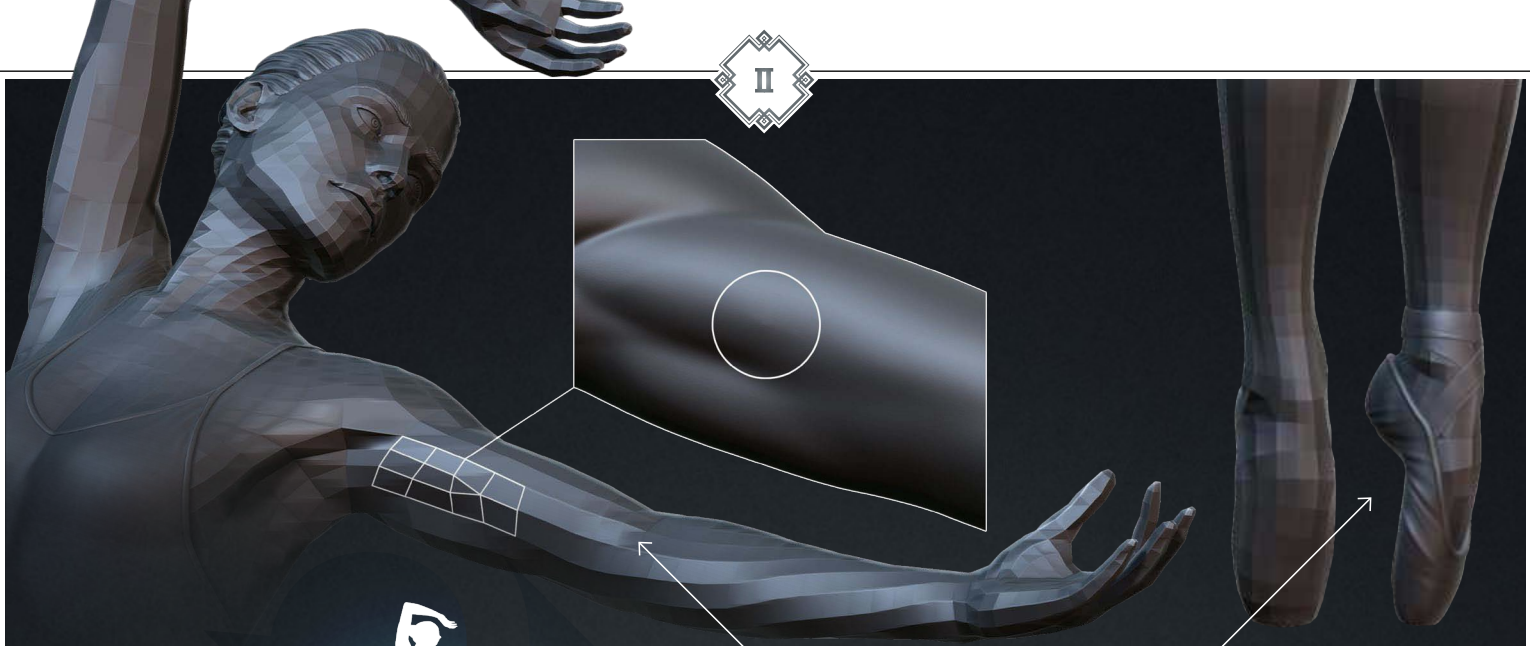
I may also remove the colour information and increase their contrast to help improve the readability of the light and shadow. Note the clear borders between light and shadow in these image selections; this makes reading the shape and form of the muscles much easier and if there are difficult areas that require further investigation, then including images of anatomy models and the bare skeleton can also prove extremely useful.



ORGANISATION

Breaking down reference images into a number of sub-categories results in a huge collection of images. At this point it's a good idea to organise these images into a sensible folder structure so that when the time comes, for example to sculpt the arch of the back, I can quickly and easily access all appropriate reference to help me with that area.





Creating the
**BASE
MESH**

Pixologic have fairly recently included the DynaMesh feature in ZBrush, which enables you to redistribute polygons across a mesh as it changes – all at the click of a button. This means it's possible to start with a simple primitive and gradually transform it into a full human figure, or anything that you can imagine. However, the resulting topology of these meshes is often a little messy and can result in some strange artefacts when sculpting at higher subdivision levels. Although you can use another relatively new feature called ZRemesher to clean up a messy DynaMesh sculpt, I still favour the creation or adjustment of a base mesh in a more traditional 3D application over these alternative methods.

Working with a base mesh in your 3D program of choice allows a much greater level of control over not only the topology, but also the general proportions of your figure. When considering the topology of the mesh there are two main areas that I focus my attention on: the distribution of polygons and their shape.

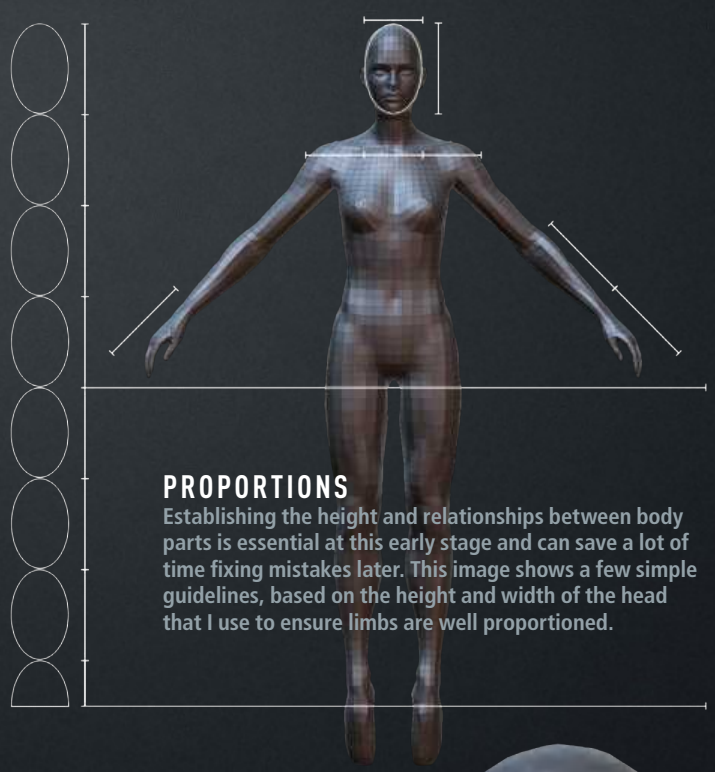
I like to work with a base mesh that's fairly low resolution, not only is this quicker to create and edit but it also makes large proportion changes and posing in ZBrush much easier at the later stages. However, when considering the distribution of polygons, certain areas will require more detail than others; facial features and other areas like fingers and toes will inevitably require more polygons in order to divide well than other areas on the body. When considering the shape of the polygons, I try to maintain uniform quads that will divide equally and not cause issues at higher subdivision levels. If creating a base mesh is too time consuming, editing an existing one is also possible. I'll start with an old favourite of mine created by the talented Eugene Fokin. I have worked on this base mesh over the years to suit my own sculpting preferences.

UNIFORM TOPOLOGY

When creating a base mesh it's always best to aim to use quad polygons only, as triangles in a base mesh can create an uneven sculpting surface at higher subdivision levels. If triangles are absolutely essential on a model, then I try to hide them in areas that will not be seen. The triangle in the base mesh I used on the inside of the bicep caused a sharp point at higher resolutions that was difficult to reduce in appearance.

SAVING TIME AND POLYGONS

The base mesh can also be adapted based on the character or figures outfit/costume that you intend to create later. As the example image shows, the finished figure is wearing a small pair of traditional ballet shoes and so including toes in the base mesh was not necessary.



PROPORTIONS

Establishing the height and relationships between body parts is essential at this early stage and can save a lot of time fixing mistakes later. This image shows a few simple guidelines, based on the height and width of the head that I use to ensure limbs are well proportioned.

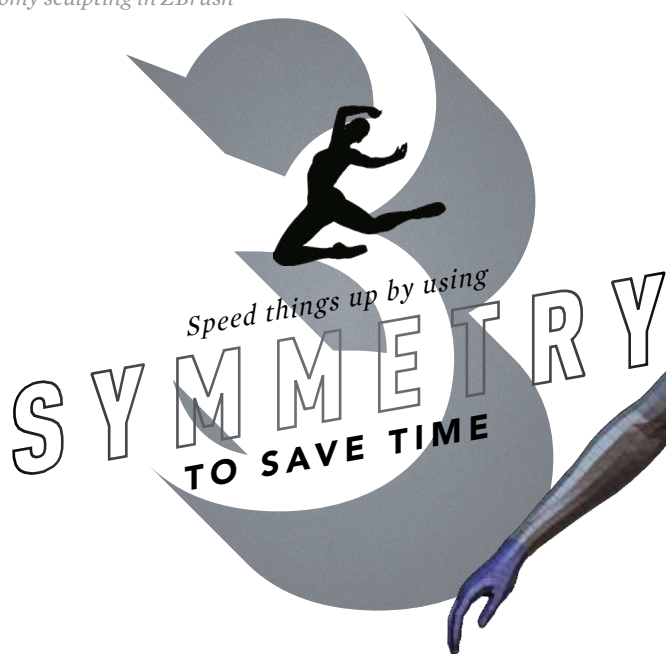
ADDING DETAIL WHERE NEEDED

Certain areas like the facial features will require more detail. While it would be possible to leave the head as a primitive shape in the base mesh, it would then require more subdivisions within ZBrush to reach a resolution that would enable detailed sculpting, which can put a strain on your computer and make the whole process more difficult.



FEATURE

Anatomy sculpting in ZBrush



There are many approaches to accurately sculpting a figure. Some artists prefer to immediately pose their model and sculpt the entire figure uniquely. While this does have advantages, I personally prefer to sculpt the model in its neutral, base mesh pose first which allows me to use ZBrush's Symmetry feature, before later posing the model and adding further refinements.

Sculpting areas on the model like the hands, feet and facial features using symmetry can save a huge amount of time initially as there are many smaller details, such as the fingernails, or folds of the eyelids that are particularly time consuming and that won't really require much variation across the model. Once I've established the details that I need on each area using symmetry, I can always sculpt further details or asymmetrical features after posing – if I need to.

Focusing on the areas previously mentioned, I subdivide the mesh once and begin to refine the sculpt, concentrating solely on establishing the underlying forms. With each subdivision I aim to sculpt the features to as detailed a representation that I can achieve at that subdivision level, before I choose to subdivide again. I find that working this way affords a greater control over the underlying structure of the area I'm working on, rather than allowing me to rush too quickly into adding fine details.

When it comes to fine details like the fingernails, corners of the mouth, or the eyelids, I find ZBrush's Masking feature to be essential. This ensures no areas are accidentally affected when sculpting and the masked areas can also be stored as polygroups for quick selection, if I need to revisit the areas later.

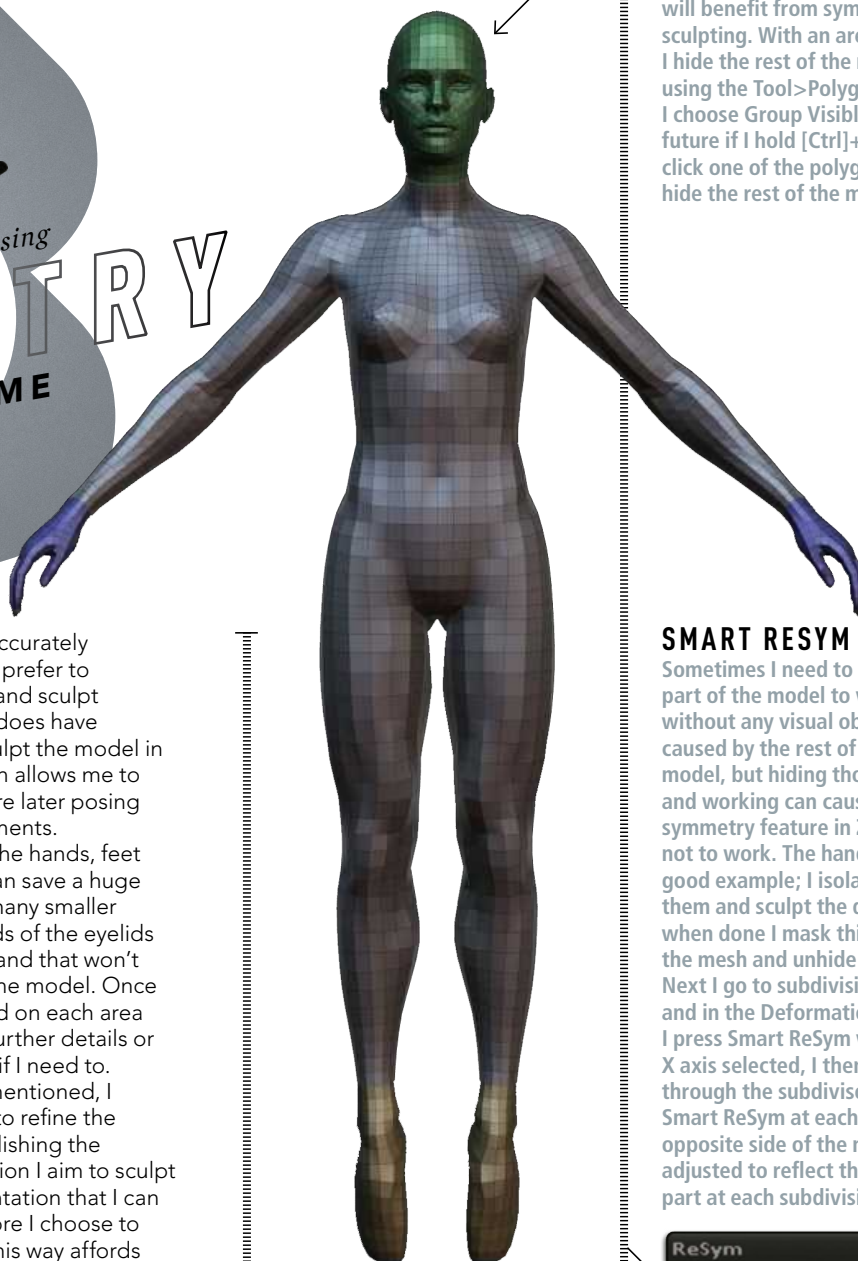


USING MASKS WHEN SCULPTING FINE DETAIL

Using the fingernails as an example, I paint a mask on the tip of the finger and use the Inflate brushes to build up the area around the nail. I then invert the mask, pull the nail out and rotate the top down a little into the finger itself. Masking makes this whole process extremely easy. When I'm done I'll simply repeat this process on the other fingers and thumb and use the Smart ReSym function to mirror this to the other hand.

POLYGROUPS

In this example image I select the areas of the model that will benefit from symmetrical sculpting. With an area selected I hide the rest of the model and using the Tool>Polygroups menu I choose Group Visible. In the future if I hold [Ctrl]+[Shift] and click one of the polygroups, it will hide the rest of the model.



SMART RESYM

Sometimes I need to isolate part of the model to work on it without any visual obstruction caused by the rest of the model, but hiding those parts and working can cause the symmetry feature in ZBrush not to work. The hands are a good example; I isolate one of them and sculpt the details and when done I mask this part of the mesh and unhide the rest. Next I go to subdivision level 1 and in the Deformation menu I press Smart ReSym with the X axis selected, I then go up through the subdivisions, using Smart ReSym at each step. The opposite side of the mesh is adjusted to reflect the masked part at each subdivision level.



Refining the large shapes of the TORSO & CREATING A ROUGH MUSCLE MAP

At this point the figure is still in a neutral pose but certain areas, like the hands and face, have been sculpted to a more final stage. I will now turn my attention to the rest of the body, and unlike the hands and face, I won't be taking this to quite such a complete stage. Instead I shall be sculpting broad shapes and masses, establishing skeletal landmarks and ensuring that the silhouette and proportion of the figure looks anatomically correct.

Using the anatomical reference images that I've collected, my aim is to first create the larger masses that exist on the figure. As I collected references I noted that some ballet performers have overly developed legs when compared to their upper body, which is an interesting observation and one that I shall try to represent subtly in my own figure by ensuring that appropriate mass is applied to the muscles of the quadriceps and gluteal areas. I also know that in the final pose the figure will have pointed toes and so I carefully add sufficient mass to the calf muscles to represent the state of tension they are in.

I will also aim to identify certain skeletal landmarks at this point – areas of the skeleton that are pressed up against the skin and not obscured by muscle. While from person to person flesh and muscle varies, the skeleton can offer a much more consistent set of reference points. By learning to identify some of these points, an artist can use them in order to provide reference markers when placing the surrounding muscles, and maintaining the proportions of the figure.

During the posing phase many of these details will deform badly and will require further sculpting. However, I personally find establishing them roughly at this stage encourages an understanding of the changes in appearance the muscles and bones go through during movement, and I find this extremely valuable.

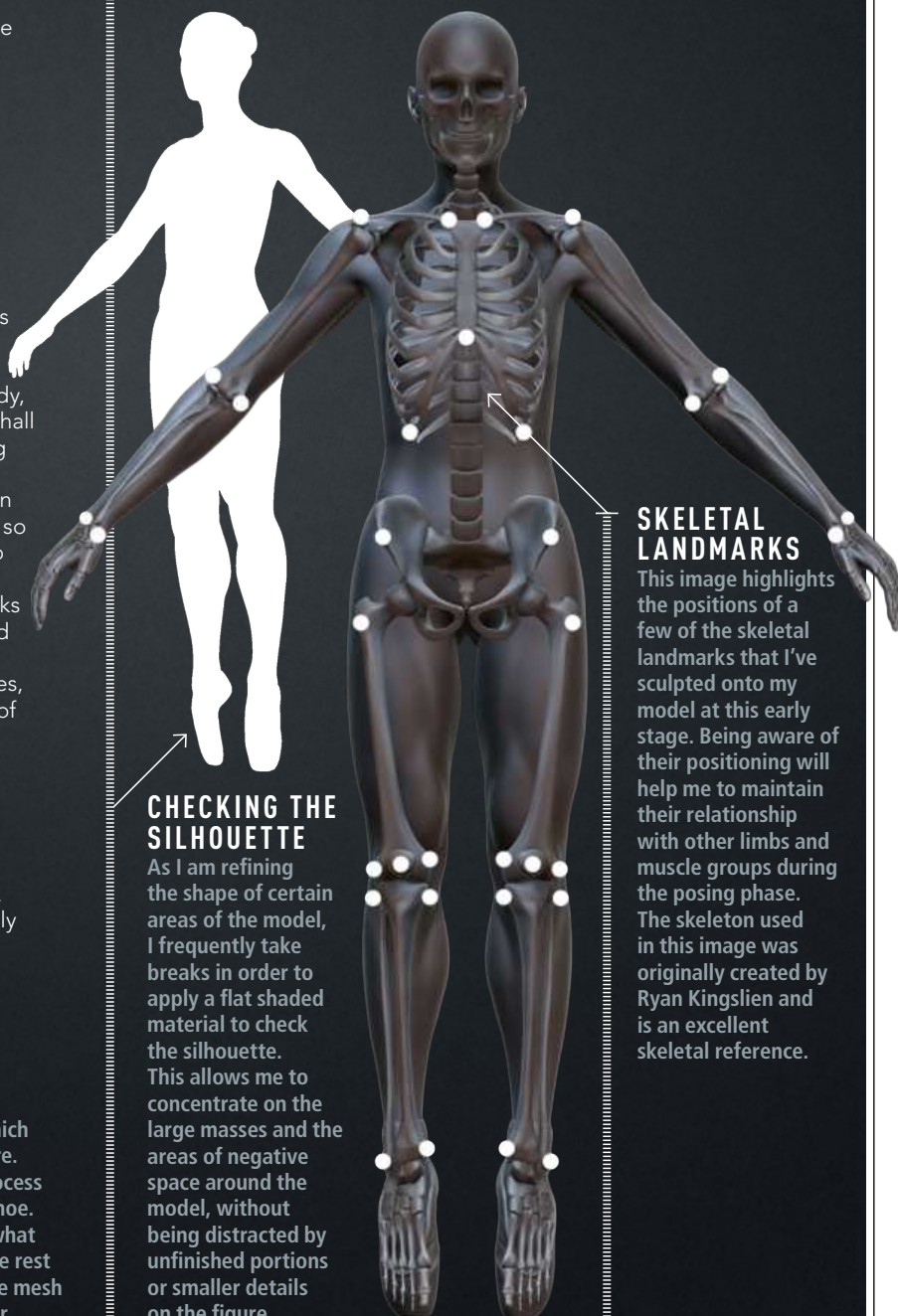


WORK SMART

This image shows the degree to which I have sculpted the feet of the figure. In the next step I'll describe the process used to create the finished ballet shoe. As you can see, I've sculpted only what can be seen of the foot and kept the rest somewhat shoe shaped to make the mesh extraction process used next, easier.

ESTABLISHING MAJOR FORMS

Instead of thinking of each muscle on the sculpt as a simple blob of virtual clay, I try to visualise it as a working anatomical vessel, understanding that when the knees bend, the quadriceps will stretch and flatten, muscle definition will become smoother and the hamstring muscles on the back of the leg will become tight and gain more mass. Attempting to visualise these changes and re-sculpting them after the model is posed is a great way to further your understanding of anatomy.



SKELETAL LANDMARKS

This image highlights the positions of a few of the skeletal landmarks that I've sculpted onto my model at this early stage. Being aware of their positioning will help me to maintain their relationship with other limbs and muscle groups during the posing phase. The skeleton used in this image was originally created by Ryan Kingslien and is an excellent skeletal reference.

CHECKING THE SILHOUETTE

As I am refining the shape of certain areas of the model, I frequently take breaks in order to apply a flat shaded material to check the silhouette. This allows me to concentrate on the large masses and the areas of negative space around the model, without being distracted by unfinished portions or smaller details on the figure.

FEATURE

Anatomy sculpting in ZBrush



Before moving on to posing the figure, I'll need to create the ballet shoes as separate subtools. This will give me the freedom to sculpt them independently of the figure, as well as allowing me the opportunity to create just one shoe before using the Duplicate and Mirror functions to make the second. This is where the choice to sculpt the foot as a shoe shaped mesh will come in handy. Holding down [Ctrl] to enable ZBrush's Masking mode, I'll now carefully paint a mask outline of a ballet slipper. Ballet slippers also have ribbon or sometimes elastic ties to keep them fastened, but for now I'm just going to focus on the slipper itself.

With the mask outline complete I use ZBrush's Extract feature to create a brand new mesh from the mask selection, choosing an appropriate thickness to represent the fabric of the shoe. From here I use ZRemesher to create clean topology to work with, before using the Smooth, Clay Tubes and Inflate brushes to transform the extracted mesh into a ballet shoe. Studying my reference I can see that the shoes also have a hard sole on the underside and so using the same mask and extract method I can create this relatively easily.

The ribbon ties are a little more tricky, but can still be made using the mask and extract method. I make each tie separately and then use the Move tool to lay them over one another. With the shoe, sole and ties complete I now use the Merge function in the Subtool palette to combine the pieces, before cloning and mirroring the completed shoe in the X axis so that the duplicate sits perfectly on the opposing foot.

MASKING

With the mask painted onto the foot of the figure, I can use the options found in the Masking palette within the Tool menu, such as Blur, Sharpen, Grown and Shrink to further tailor the mask to my needs before I extract a new mesh from the mask selection.



EXTRACTING

Now that I'm happy with my shoe mask I can use the Extract options located at the bottom of the Subtool menu to create my new geometry. I use a Thickness value of 0.003 to ensure the shoe resembles the thin fabric they're made from. Using ZRemesher then creates the clean mesh seen here that's ready to sculpt.

ADDING DETAILS

Using further masking as well as the Clay Tubes, Smooth, Dam_Standard and hPolish brushes I can add some fabric detail to the surface of the shoes to make them feel a little more natural.



CREATING THE LEOTARD

The leotard is created in the same way, with the only difference being that it's made after the figure has been posed. With the mesh extracted from the main body after posing, using ZRemesher to create a clean topology is required before refining the sculpt with the usual brushes.



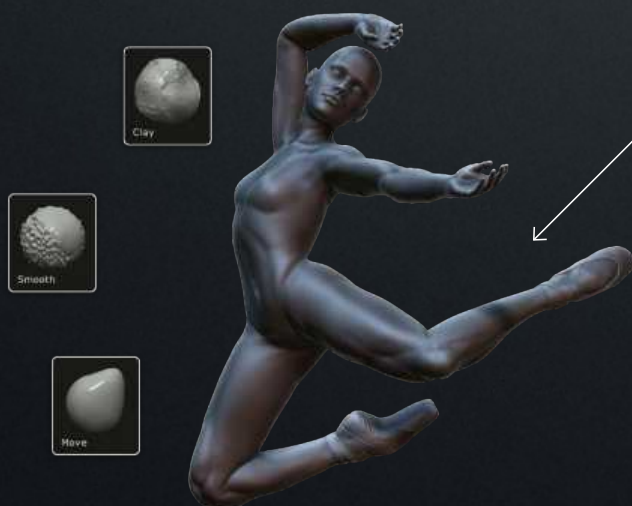
Using Transpose Master to POSE THE FIGURE

My figure is now ready to be posed. It's important at this stage to remember that all of the sculpting so far on her body has been created with the aim of refining the silhouette and forms of the major muscle groups and skeletal landmarks, rather than with the intention of sculpting final muscular detail. Once the figure is posed, I'll do another sculpting pass, this time with the intention of capturing the musculature and skeletal landmarks in their posed positions.

Because the figure is now comprised of multiple subtools, I need to use ZBrush's Transpose Master function to pose all of the tools at the same time. Transpose Master creates a combined version of all of my subtools allowing me to pose them together, before then transferring this pose to each subtool individually.

Before I begin I quickly make sure that none of my subtools are partially hidden, to avoid any errors later. I then save my ZTool and create a new, clean project before using Transpose Master. ZBrush can occasionally select the wrong model from the Tools palette when trying to transfer the final pose and so having a clean project can help avoid this problem.

When this is done I then navigate to the ZPlugin>Transpose Master sub palette and select the T PoseMesh option. ZBrush will now take a moment to analyse each subtool before creating the combined mesh, which I can now pose more easily.



TRANPOSE LINES

With the low resolution transpose model now created, I can use the move and rotate transpose lines in conjunction with masking to pose my figure. As an example, with Rotate selected and holding [Ctrl] I draw a transpose line from the hip to the ankle, from here I can rotate the leg into a new position.

FURTHER MASKING

After holding [Ctrl] and drawing the transpose line, I also manually adjust the mask by painting it by hand, as well as using the BlurMask option under the Masking sub-palette in the Tool menu. This gives me a little extra control over the amount of unwanted distortion of the mesh that will occur as I pose it.

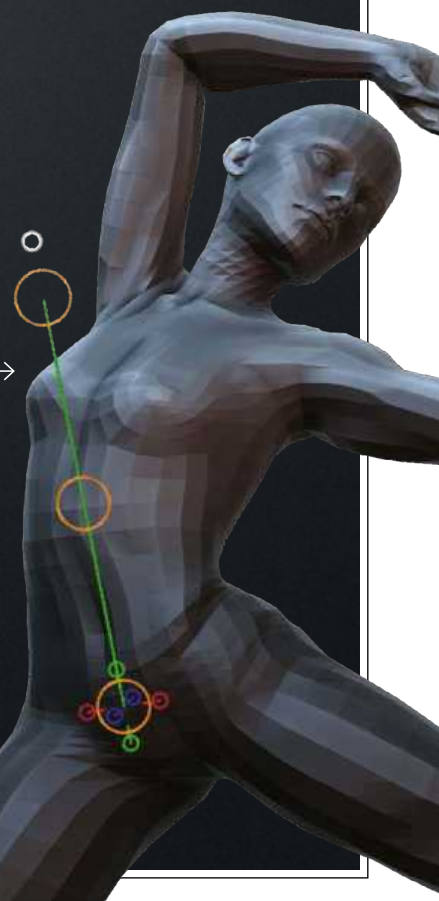
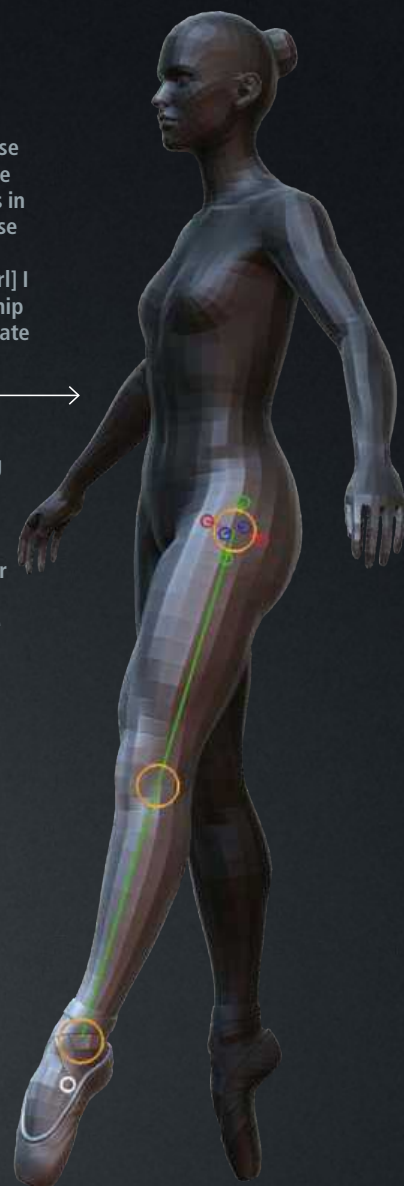


A LITTLE AT A TIME

A useful tip when posing your figure, that will help reduce unwanted distortion, is to redraw the transpose lines often and pose in gradual steps. As my figure's pose is quite extreme with her arms and legs bent at acute angles, there will be a fair amount of collapsed or warped geometry, but moving each limb a little at a time will help reduce this significantly.

CORRECTING DEFORMATIONS

As this image shows, when the posing is complete there will be many areas of the model that have been distorted and look incorrect. I'll use the Move brush as well as other sculpting tools to quickly correct some of the distortion manually before using the T Pose>SubT button located in the Transpose Master menu, to transfer the final pose back to my individual subtools.



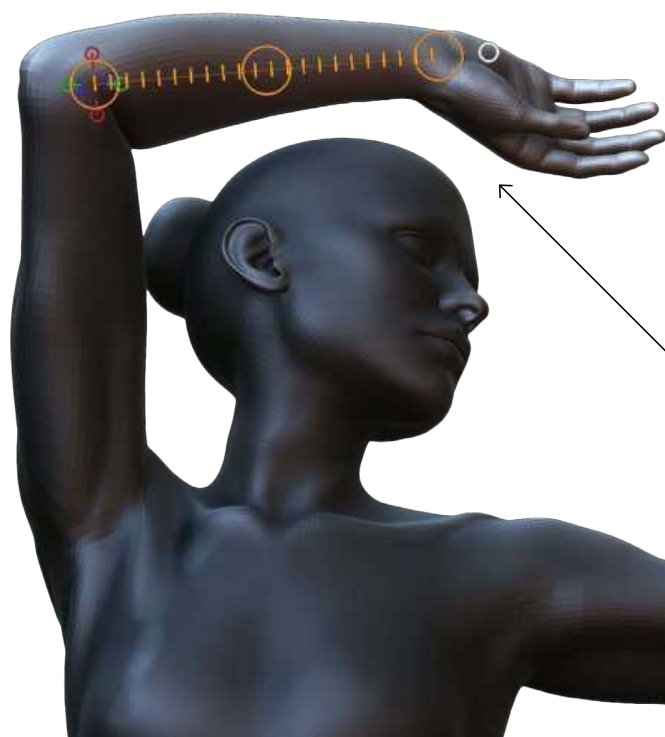
FEATURE

Anatomy sculpting in ZBrush



MEASURING DISTANCES

Paying attention to the distances between various skeletal landmarks and the general length of limbs can help me ensure that the posing process has not deformed the figure's proportions too much. Taking screenshots with Perspective turned 'off' and using guidelines to measure is a simple way of checking distances.



Fixing the PROPORTIONS & THE MUSCULATURE

With the pose transferred back to the higher resolution subtools it should be immediately apparent that the musculature will now need to be refined, and in many cases re-sculpted completely in order to represent it accurately.

However, the initial sculpting pass on the muscles has helped me to keep track of the rotation and orientation of limbs, as well as the location of certain skeletal landmarks during posing.

Before beginning the amendments to the muscles I must first ensure that the length and proportions of the figure's limbs are intact. This is where having sculpted some of the skeletal landmarks comes in handy, as I can use these as reference points while making minor adjustments to the figure, using the Move brush or Transpose tools. An example might be to make a comparison of the distance between the tips of the fingers and elbow joint on the right arm, to that same distance on the left arm, in order to ensure they are consistent.

Having made the proportion fixes to the figure, I'm now ready to begin making further adjustments to the figure's anatomy in order to accurately portray the muscles in their new positions.

To make this next stage of the process easier, as well as frequently consulting a variety of reference images, a fundamental understanding of human anatomy is essential. However, more important than learning the names of every muscle and bone (which will come with practise and experience), is developing an understanding of their function, arrangement and relationship with one another. In the next step I'll take a look at the way some muscles function, as well as how an understanding of these systems can help make this figure's anatomy more accurate.

FURTHER TRANSPOSING

Using the Move brush and Transpose tools can help when making required adjustments to the proportions of the figure, but be aware that without proper masking some other areas can also be unintentionally affected by the falloff of the tool.



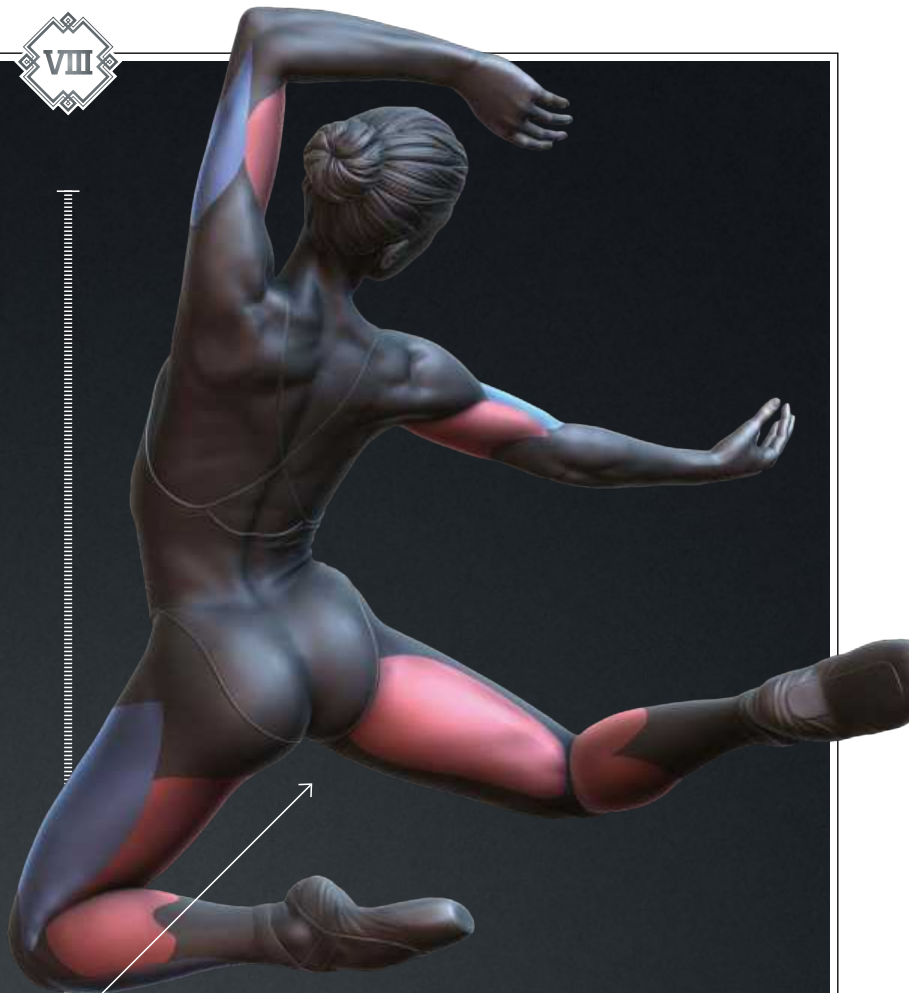
Understanding MUSCLE MECHANICS

Developing a deeper understanding of human anatomy and its many intricacies is something that can often take a person many years of study. However there are some simple principles and practices, that when understood and incorporated into your own projects, can pave the way to further development and improvement.

An important principle to consider regarding the structure of muscles, is that in order for a skeletal muscle to create movement and drive our bodies into action it must cross a joint. In most cases, a joint is comprised of two bones and the muscles are attached via tendons. There are two ends to a muscle: the origin, which is the end that attaches to the stationary bone and the insertion, which is the end that attaches to the moving bone. However, because muscles are only capable of pulling and not pushing, many work in pairs – these pairs are called antagonistic pairs. As one muscle contracts and pulls on the bone it is attached to, it shortens in length creating a bulge (think of flexing your bicep). While this happens the other muscle in the pair relaxes, lengthening and becoming smoother in appearance. Understanding these mechanics and the physiological and aesthetic impact on the body they have allows us as artists to attempt to capture this when sculpting.

Looking at my figure, I try to determine the movement and force acting upon her limbs and which muscle is therefore the agonist (the contracting muscle that will be shortening and creating a bulge), and which muscle is the antagonist (the muscle that relaxes and becomes smoother and longer in appearance). I can then use this information to inform my sculpting and create believable muscles that appear to exert force and power.

A valuable practice that can make these refinements much easier is to isolate the more difficult areas of a figure and capture a screenshot, before tracing over it to create an *écorché*. An *écorché* is a drawing that shows the muscles of the figure without skin and it's often a little easier to quickly sketch the muscle groups in 2D before attempting to fully realise them in 3D. The forearms for example are notoriously difficult and so I have provided an example of the type of image I might create for myself, before attempting to sculpt this area in ZBrush.

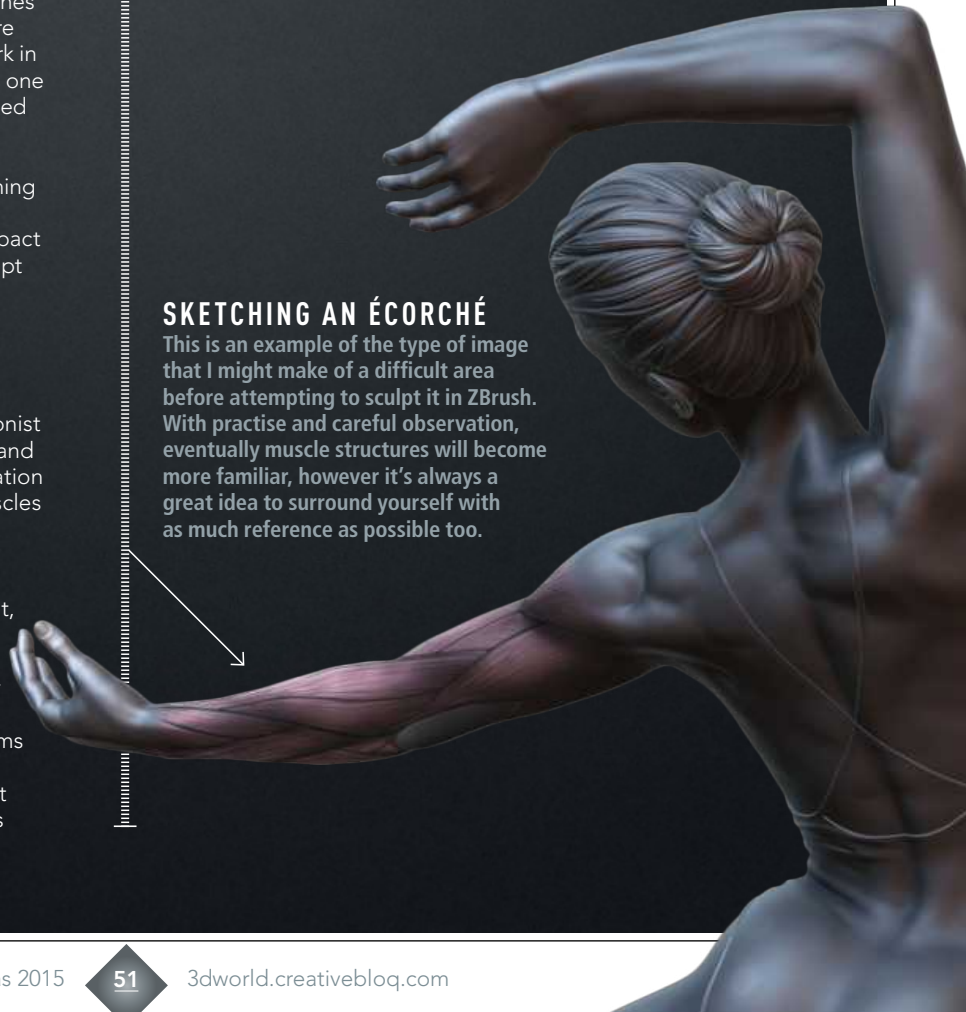


ANTAGONISTIC PAIRS

This image highlights the antagonistic pairing of the quadriceps and hamstring muscles in the upper leg, and biceps and tricep muscles in the upper arm. I have highlighted the prime movers, or agonists in red. Using the leg as an example we can see the hamstrings are contracting, acting as the agonist they shorten to create a bulging mass visible under the skin and fatty tissue. The quadriceps act as the antagonist, lengthening and becoming smoother in appearance.

SKETCHING AN ÉCORCHÉ

This is an example of the type of image that I might make of a difficult area before attempting to sculpt it in ZBrush. With practise and careful observation, eventually muscle structures will become more familiar, however it's always a great idea to surround yourself with as much reference as possible too.



FEATURE

Anatomy sculpting in ZBrush



MASKING

At this stage the masking of the hair can be extremely fast and loose. Just as with previous mask and extract methods, if the resulting mesh is too messy to sculpt I use ZRemesher to create a clean topology to sculpt on.



LARGE FORMS FIRST

The Clay Tubes brush is one of my favourites in ZBrush. With long sweeps from the front of the head to the back, I can easily create clumping shapes that can be refined later. Staying at a low subdivision level makes smoothing these shapes easier.



CREATING THE BUN

To achieve the sharp transition from the head of hair to the bun, I create a brand new mesh with the mask and extract method, followed once again with ZRemesher. In order to create the sensation of hair being pulled into the centre of the bun as my references illustrate, I use the Slash and Dam_Standard brushes to add the finer hair details.



With the majority of the sculpting work on the body and face complete, the hair is one of the last things to finalise. I once again consult my collected references before settling on a style that I believe suits the ballet theme. Having the hair pulled back tightly into a high bun seems common and is a style that will lend itself well to sculpting. Although ZBrush now gives artists the capacity to create hair using FibreMesh, I like to maintain the sculpture aesthetic with this figure and create the hair in a more traditional manner.

Once again, I use the mask and extract method to create a new mesh and this time I use DynaMesh to allow a little more freedom when sculpting. Using the Move brush I push and pull the mesh while updating the geometry using DynaMesh whenever I need to. Gradually I begin to see a very rough hairstyle as a result of my efforts.

With the base form established I exit DynaMesh and begin my first pass at refining the mass. Just as I have done with the rest of the figure, I start at the lowest subdivision and gradually begin to shape the mesh as I move up through each level. When sculpting hair it is tempting to rush into sculpting the fine, thin details at higher subdivisions straight away, however it's much more advisable to try to see and sculpt the large clumps of hair that affect the main shape and silhouette of the hairstyle first.

When I'm happy with the overall shape I then use a combination of the Slash, Smooth, Clay Tubes and Dam_Standard brushes to achieve the finer strands, gliding the brush through the mesh with long sweeps in the same general direction. Finally, I use the Move brush to introduce a few waves and irregularities in the hair flow for a little added interest.

THE FINISHED RESULT

Using the Clay Tubes brush to build up large forms, followed by the Smooth, Slash, Pinch and Dam_Standard brushes to add details, is a relatively quick process and can yield nice results. When I'm happy with the hair I move on to the eyebrows, where I use the exact same techniques.



CRITIQUE AND FINAL CHECKS

And finally

With all parts of the figure created and sculpted to a suitable detail level, it's at this point that I take a little break away from the project. Often after spending so much time looking at the same model it's easy to begin to get too familiar with it and sometimes mistakes that may seem obvious to others, completely pass you by. Taking a short break for a day, a week, or even longer can really do wonders to refresh the mind, giving you a new perspective on the model when you return to it.

Obviously when working under a time constraint this short break may not be possible and so at times such as these, trusting your peers and fellow artists to give you an honest critique is just as valuable. When working with human anatomy, even the untrained eye can spot mistakes, given that the human body is something that most people see every day and so taking time to seek others opinions on your work can really help you to further iterate and improve upon your models.

In order to help the critical process, I use lighting within ZBrush to illuminate the model from a variety of angles, and also create quick renders with shadows cast to help me analyse the underlying volume and form of the model.

I also use the wide selection of MatCaps within ZBrush to help me spot any rogue lumps in its surface. Materials with high reflectivity are particularly helpful in this instance.

By fixing problems I encounter along the way, all that's left now is to continue this iterative process until I'm completely satisfied with the model under all lighting and material scenarios, before finally calling this dynamic anatomy study complete.



CHECKING THE FIGURE USING LIGHTING

Using the Light menu in ZBrush in conjunction with one of the standard materials – or even better, a material of your own making – allows you to control the direction and intensity of the light source acting on your model. Similar to the lighting guidelines when choosing reference images, using lighting with strong directionality and contrast will help make understanding the surfaces of your model much easier.



CHECKING THE FIGURE USING MATCAPS

Here is a small selection of different MatCap render tests: Go to Render menu>Render Properties, then enable Shadows and Ambient Occlusion and execute a Best Preview Render pass to achieve similar results.



MIRRORING THE MODEL

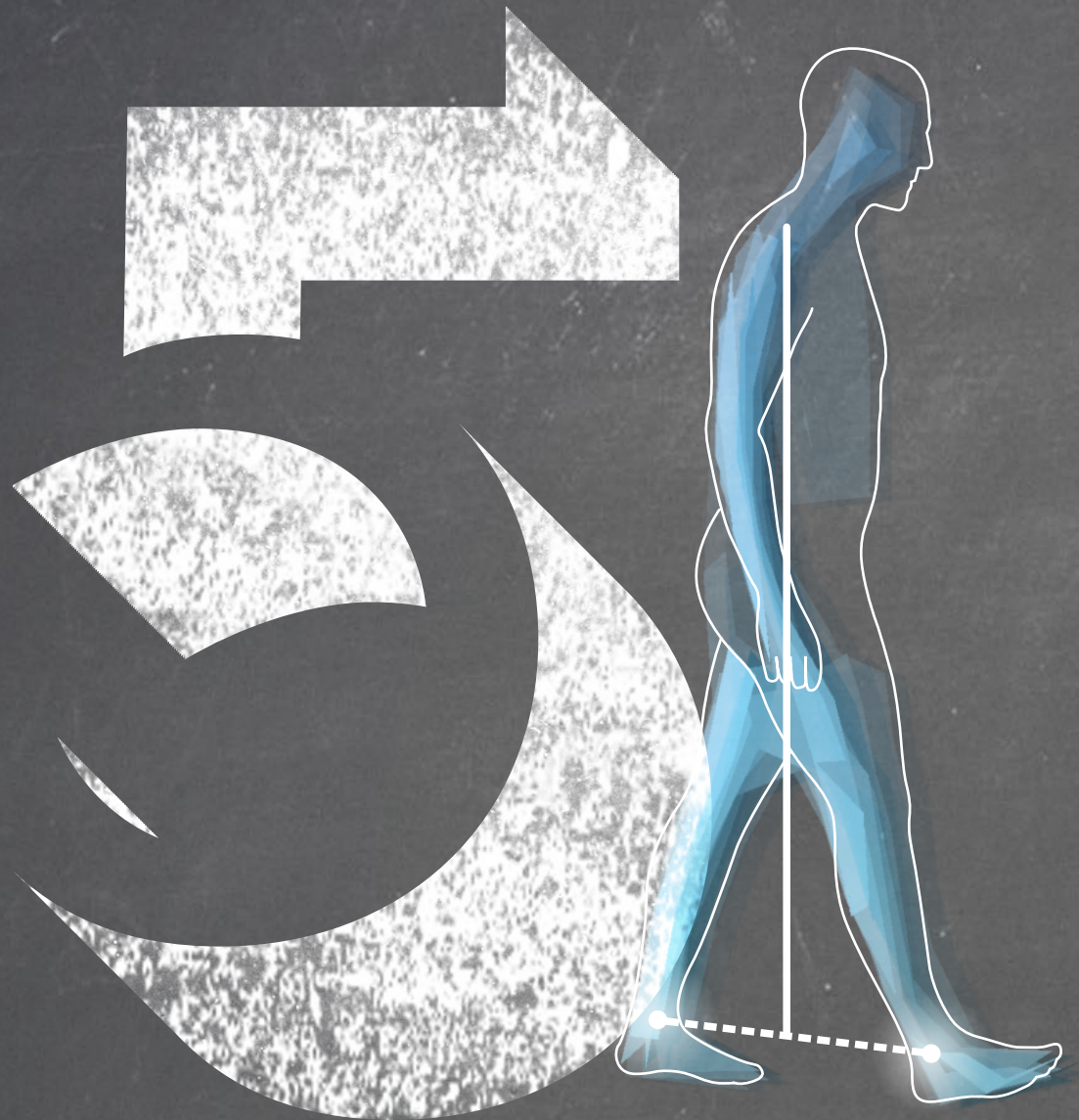
Just as a traditional artist might mirror an image to look at their work from a new perspective, I also use the Mirror function in the Deformation menu inside ZBrush to do the same. After working for so long with the model facing a certain direction, it was really refreshing to see it from this new angle.



AUTHOR PROFILE

Fred Chapman

Fred has 15 years' experience in VFX and animation, specialising in realistic movement and deformation. His credits include Chappie, Teenage Mutant Ninja Turtles, The Thing, and several Harry Potter movies. dynamic-anatomy.com

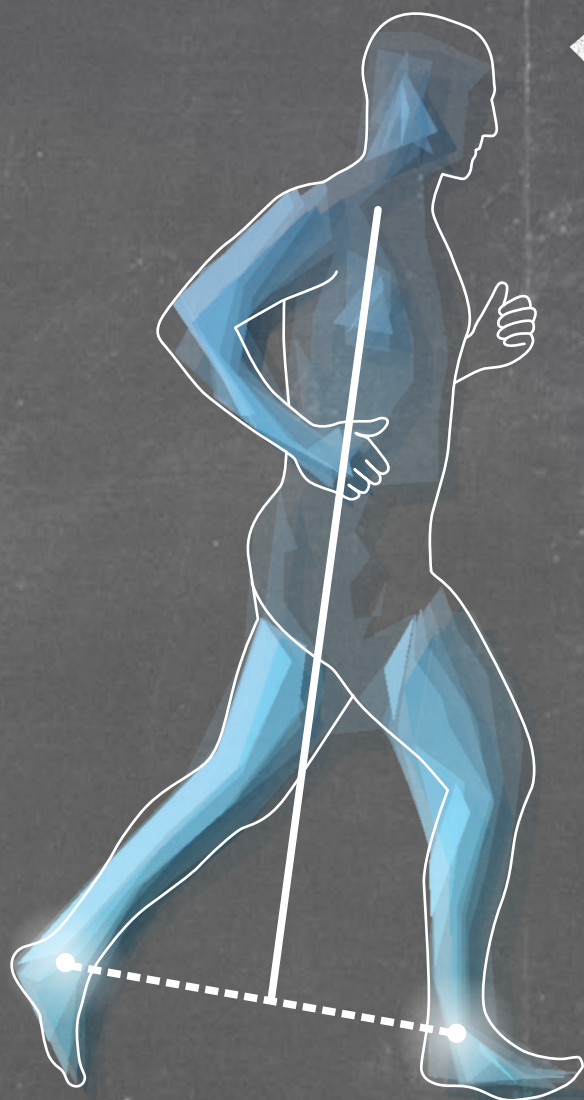


SIMPLE WAYS TO FIX YOUR ANIMATION

Fred Chapman reveals five common mistakes in animated run and walk cycles, and how to fix them

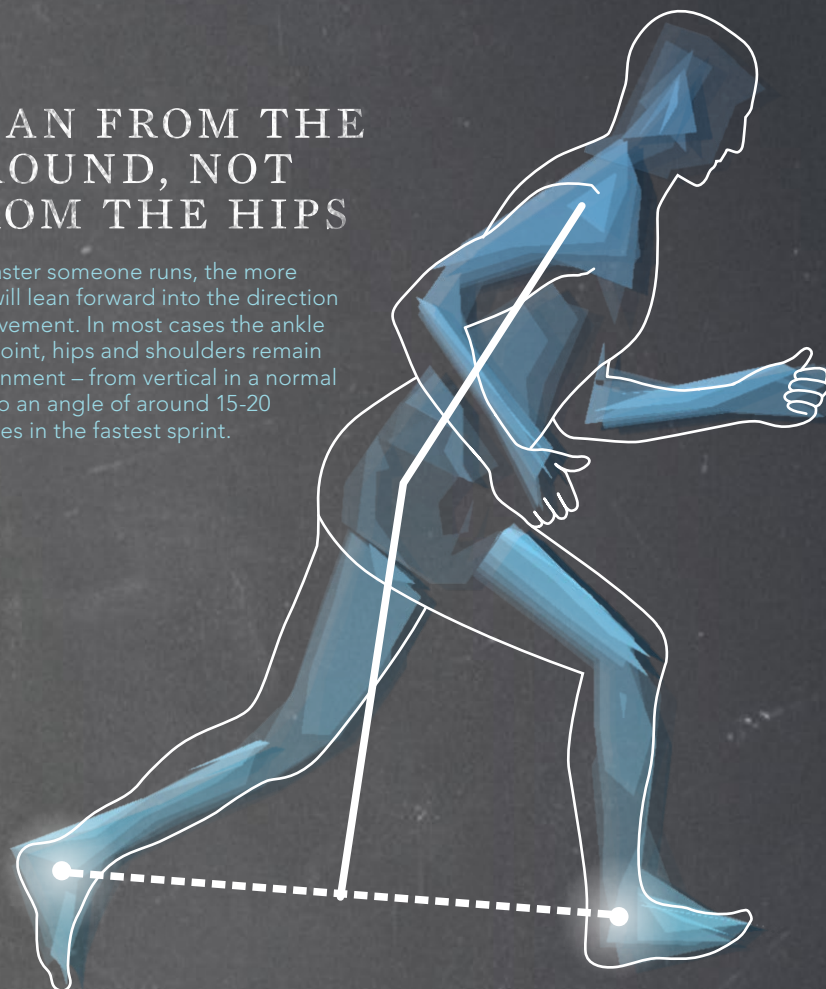
Why are so many animated humans instantly recognisable as being animated? Why does a pose that looks so dynamic in the static image of a comic, lose its impact when the exact same pose is used as a keyframe in an animation?

Even if you're creating something stylised that is not intended to look photoreal, badly animated movement can appear jarring to the viewer. Here we're going to look at five of the most common reasons that make animated walk and run cycles stand out and what you can do to fix them. ■



LEAN FROM THE GROUND, NOT FROM THE HIPS

The faster someone runs, the more they will lean forward into the direction of movement. In most cases the ankle mid-point, hips and shoulders remain in alignment – from vertical in a normal walk to an angle of around 15-20 degrees in the fastest sprint.



Common mistake

Too often in animated characters the angle of the spine is exaggerated. This creates a very dynamic look in a static pose or single keyframe, but in an animation it creates a disconnect between the weight of the upper body and how the legs are moving.

How to fix it

Move the hips forward to even out the angle between the centre of the ankles, hips and shoulders. This may not look as impactful on a single frame but will give better animated results.

Exception to the rule

If a runner or walker is very tired or has weak core and lower back muscles, they may round their back more. This pushes their shoulders forward and their hips will then move back to compensate for the weight.

FEATURE

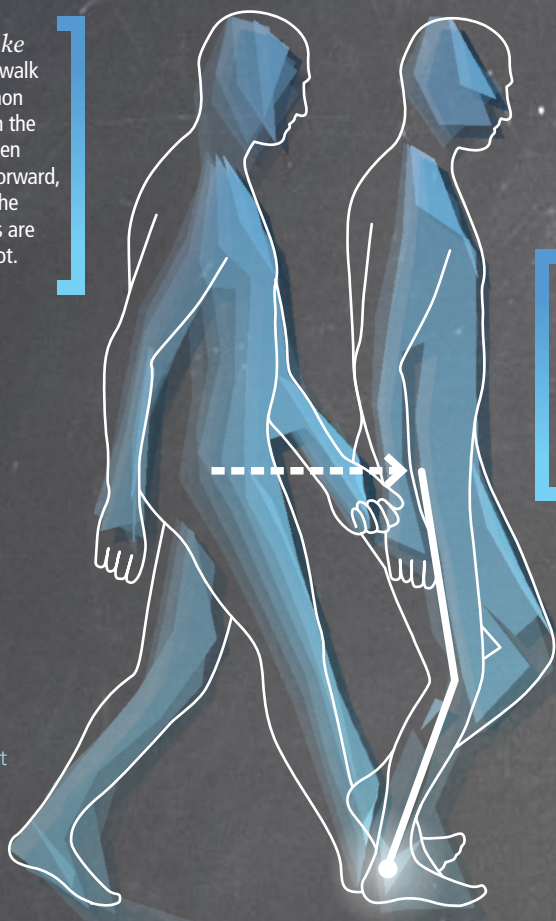
Fix your animation

2

KNEE BEND

Straight legs use less energy in muscles to support body weight. Bent legs are better able to act as springs and absorb shocks. In a run the impact is much higher, so shock absorption is more important than efficiency. A runner's legs will never completely straighten while they are supporting the body weight. In a walk the body's weight is gently rolled from one leg to the next. Efficiency is more important than shock absorption. The front leg will straighten just before weight is transferred on to it. The hips then roll up and over the straight leg in an arc.

Common mistake
When animating a walk using IK, it is common to place the foot on the ground out front then translate the hips forward, causing a bend in the knee when the hips are directly over the foot.

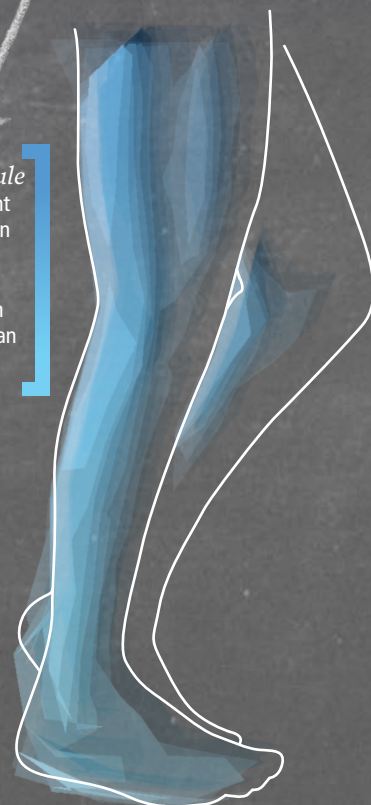


How to fix it

Ensure that the hips are always translated vertically so that the supporting leg remains almost straight through the whole time it is weight-bearing.

Exception to the rule

If you intentionally want the character to have an exaggerated bounce in their step. This is closer to the catch and launch cycle of a run rather than the roll of a walk.



3

FOOT PLANT

In the catch-launch run cycle, the catch phase involves dissipating movement energy from the impact and takes place while the foot is on the ground in front of the body's centre of gravity. The launch phase is everything that happens while the foot is on the ground behind the centre of gravity and is where all the power to move forward comes from. In an efficient run the catch phase in front of the hips should be much smaller than the launch phase behind the hips.

Common mistake

When you think of the classic silhouette of a runner, the front foot is positioned way out in front of the body. What it doesn't show is that the foot is off the ground and doesn't contact the ground until it is travelling back and almost under the hips.



How to fix it

When animating a run, don't place the foot on the ground at its furthest forward point in the cycle, keep it off the ground until a couple of frames before the hips are over it.

Exception to the rule

If you are animating an inexperienced runner the foot will likely contact the ground further forward and the result will be a much bigger impact, sending shocks through the whole body.

4

FOOT STRIKE

Just as with the knee bend, the ankle can also absorb impact by acting as a spring. The faster the run, the more the weight will shift from the heel of the foot to the ball of the foot. A walker will strike the ground with their heel whereas a sprinter's heel will never touch the ground.

Common mistake
I often see animators using similar heel-to-toe foot roll in both run and walk cycles. In reality for faster run cycles, the heel shouldn't touch the ground as the ankle acts as a spring, absorbing impact.

How to fix it
If you are animating a fast run, shorten the foot roll so instead of rolling from the heel to the toes, just roll from the ball to the toes.

Exception to the rule
An inexperienced or very tired runner is more likely to keep a heel strike even at a higher speed. Without the extra shock absorption from the foot each impact should be animated with extra jarring action.



5

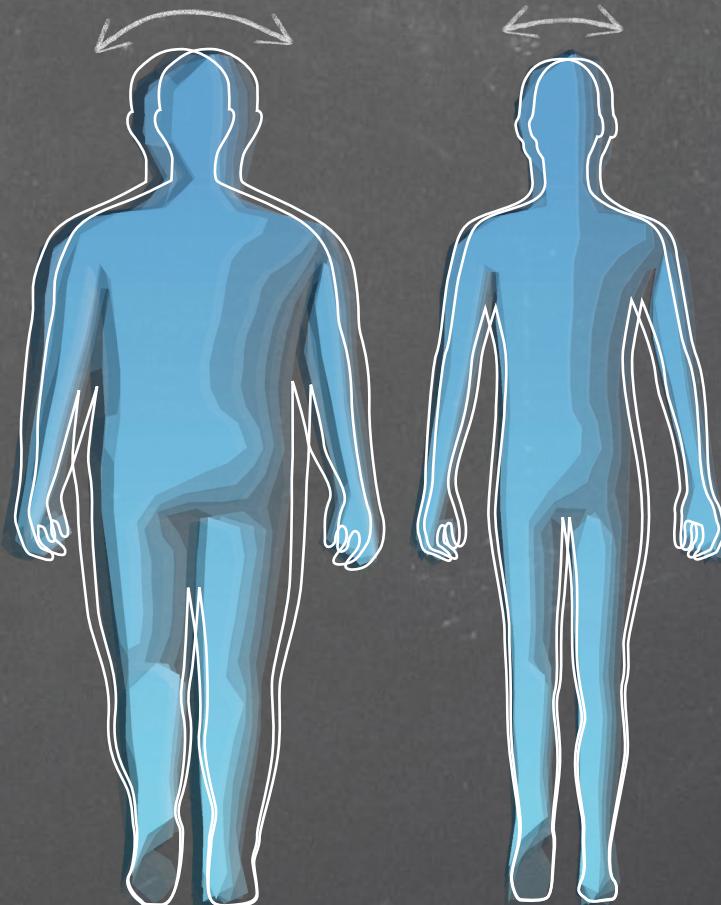
WEIGHT

Highlighting and being able to show how a character's weight affects their movement will lend your animation more credibility. The more weight someone is carrying, the more weight they need to move from side to side to keep it balanced over the supporting leg.

Common mistake
The amount of side-to-side movement through the walk cycle is not adjusted relative to the weight of the character.

How to fix it
Add more side-to-side weight movement in heavier characters and less movement in smaller ones.

Exception to the rule
Everyone's walk cycle is slightly different. It is possible for even some skinny people to walk with big side-to-side weight shifts in their upper torso. Due to the much bigger side-to-side movement, this style of walking often goes hand in hand with feet that turn out to the side. Watch Charlie Chaplin as an example of this.



ZBRUSH 4R7[®]

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TUTORIALS

Practical tips and tutorials from pro artists to improve your CG skills

Free! Joker
ZBrush model

FOR MORE ON YOUR
**FREE DOWNLOADS
& VIDEO TRAINING**
TURN TO PAGE 6

GET YOUR RESOURCES

You're three steps away from this issue's video training and files...

1. GO TO THE WEBSITE

Type this into your browser's address bar:
www.creativebloq.com/vault/3dw202

2. FIND THE FILES YOU WANT

Search the list of free resources to find the video and files you want.

3. DOWNLOAD WHAT YOU NEED

Click the Download buttons and your files will save to your PC or Mac.



60 UNITING 2D AND 3D: MODELLING THE JOKER

Joe Grundfast uses ZBrush, KeyShot and Photoshop to refresh an old project



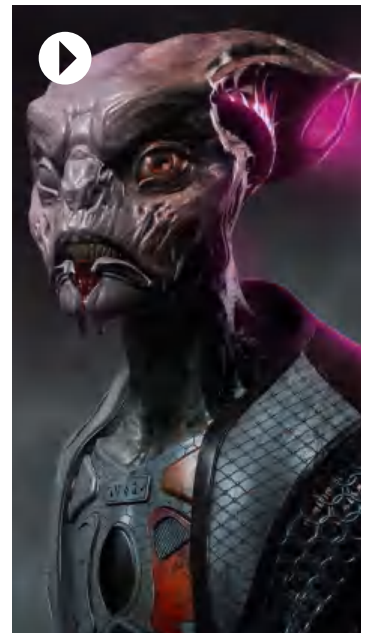
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Setting up the lighting for a still life render



74 CREATE AN ALIEN

Master the Weta modelling workflow



ARTIST PROFILE

Joe Grundfast

Joe Grundfast is a freelance ZBrush artist and 3D generalist in NYC. His work includes TV, web, installation and film.

www.facebook.com/JoeGrundfast

ZBRUSH | KEYSHOT | 3DS MAX | PHOTOSHOP

UNITING 3D AND 2D: MODELLING THE JOKER

Joe Grundfast uses ZBrush and KeyShot to overhaul an old project into a detailed digital painting of the Clown Prince of Crime

TOPICS COVERED

- ▶ Collaboration and conceiving
- ▶ Form and detail
- ▶ Texturing and rendering
- ▶ Exploration and story
- ▶ Photobash

In this tutorial I'll dust off my old ZBrush model of the Joker as a base for a new digital painting. This Joker was my first 3D project and landed me my first job in the CG industry in 2007. Since then I've worked hard to refine my skills, while picking up new ones along the way. I'll share with you what I've learnt as I use ZBrush, KeyShot, 3ds

Max, and Photoshop to revamp and build a more compelling scene for my take on the Joker.

Digital painting can be a lot of fun, especially when combining a 2D paint program with digital sculpting software. Photobashing is the process of stitching photo elements together quickly to create a detailed concept painting,

and Photoshop makes this simple. ZBrush, which leads the vanguard in free-form digital sculpting, allows greater freedom of exploration by providing an intuitive virtual workbench for artists to easily sculpt any concept in 3D.

Entire libraries of specially designed rendered content may be created for use in Photoshop,

JOKE'S ON YOU!
Staring through the eyes
of the terrified warden
of Arkham, the Joker
unleashes hell using
some of his favourite toys

FREE!
GET THIS
MODEL



freeing the artist from relying solely on photos. With this combination of 2D and 3D comes speed and far wider scope of creativity than ever before. To help you out I've included my final ZBrush model of the Joker, and the files you need, on this issue's online Vault.

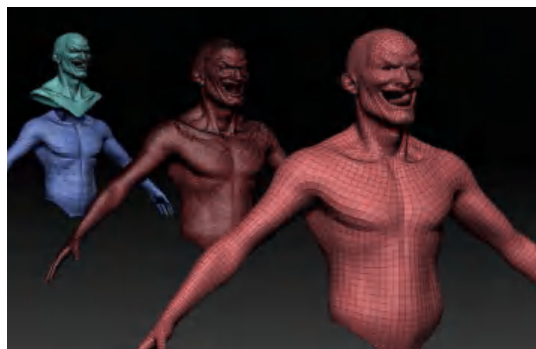
For all the assets you need go to creativeblog.com/vault/3dw202

1 CONCEPTING

My Joker from 2007 was comprised of a ZBrush render on a photo background. For this tutorial I collaborated with my mentor, tossing around a few thumbnail sketches of grander designs. Unsure of a story concept this early on, we agreed that the first step was to give him a body and a cool pose. For the pose I referenced a Jim Lee image of the Joker holding a revolver and flipping a card deck.

2 FACIAL REFINEMENT

I refine the bust by making subtle improvements to the facial anatomy with the Move and Clay Build Up brushes. The bust consists of five subdivision levels. As the levels increase the polygon count increases, providing more surface topology for finer detail. I adjust the tension of the skin around the smile, shape of the ears, contours of the forehead, and reduce the bulbous nose. I'll continue to refine the face throughout the project.



3 CREATE THE BASE MESH

The geometry for the torso is from a previous project. I subdivide the torso to a polygon density equal to the bust, merge the two subtools and then turn on Tool>Geometry>DynaMesh which glues them together. DynaMesh redistributes topology and combines geometry on the fly. With the head and torso as one piece, I use Tool>Geometry>ZRemesher to decrease the polycount and refine the edge flow to create my new base mesh.



4 DETAIL WITH PROJECTION

To add the detail back into the face, I add higher subdivisions to the new base mesh. I use the Lasso Mask brush to mask off the body and fade it into the head. This adds falloff in the neck area which minimises distortion from the projection, due to discrepancy in shapes. With a duplicate of the bust, I use Tool>Subtool>Project to recreate the bust's detail on the face of the new mesh, eliminating the need to resculpt it all by hand.

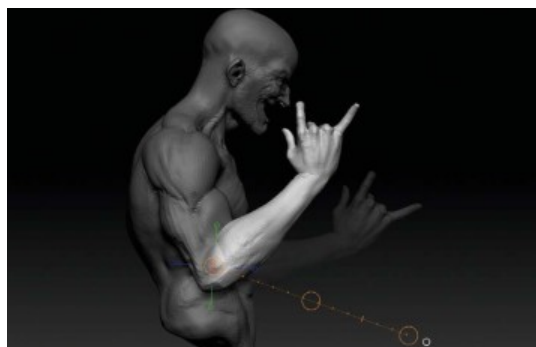
THE JOKER'S PLAYLIST

Motivation through music

I often listen to music while I work, as I find it helps to set the right mood and in a sense creates a soundtrack for a project.

The tone for this piece was set by the title sequence theme to the David Fincher film *Se7en*, composed by Nine Inch Nails.

Other music included additional songs from Nine Inch Nails, as well as sinister tunes *Retrovertigo* and *My Ass Is On Fire* by the band Mr. Bungle.



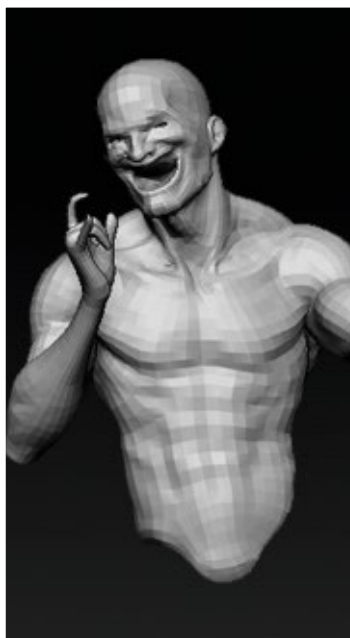
5 POSE THE CHARACTER

For posing I use the Transpose Rotation tool by first masking out an extremity, inverting the mask and then drawing out the transpose line from my intended pivot point (an elbow for example). By pushing or pulling the opposite end of the transpose line, the tool acts as a lever which manoeuvres the unmasked portion into position. Using this process, I create a rough pose based on the Jim Lee drawing.



6 SCULPTING ANATOMY

I favour the Clay Build Up and Damian Standard brushes when sculpting a character's musculature. It's best to get the proportions as close to final as possible at each given subdivision level, rather than trying to sculpt at the highest level right off the bat. Also, it goes without saying that knowledge of anatomy is key in determining where to put your brush strokes. I rough out the major muscle groups and use the hPolish brush to refine the masses.



7 PROXIMITY BASED STYLING

Design can be approached in a manner based on proximity. In ZBrush, lower subdivisions only permit blocking out silhouettes and main masses and aspects of the model seen from a far proximity. As subdivision levels increase, so do finer details observable from shorter distances, like muscle tone and skin pores. The challenge is striking a harmony between levels. This is called Proximity Based Styling: perfecting levels of detail based on viewer distance.



8 ZMODEL THE REVOLVER

The ZModeler brush offers an intuitive interface for rapid low polygon modelling. After loading a revolver reference image into Spotlight in the Texture menu, I model by initialising with a box primitive from the Tool menu. Spacebar brings up ZModeler's function menus. Using QMesh option, I extrude the contours of the gun and its components. With Dynamic Subdivision enabled, I see a real time, subdivided preview of my low poly modelling progress.



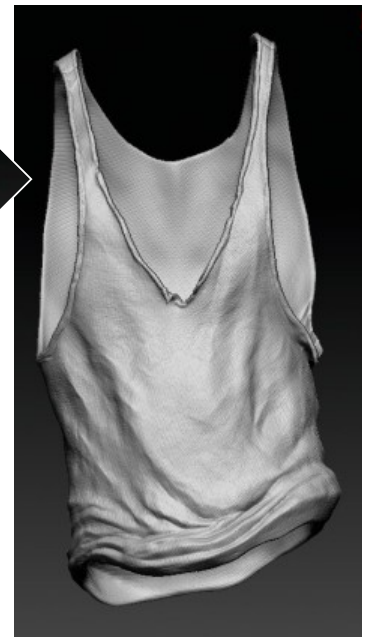
9 ZMODEL THE CARD DECK

I initialise another box primitive and QMesh extrusions to the proportions of a playing card deck. Using a combination of Transpose Move and line segment insertions, I make it seem as if it's bending in the Joker's hand by distorting the centre of the deck upwards. I then frame the scene with additional flying cards using the same ZModeler processes and I position them with Transpose Move.



10 EXTRACTING THE T-SHIRT

For the Joker's wardrobe design, I shake things up a little bit and depict him in a logo undershirt. To create the shirt I paint a mask over the torso and use Tool>Subtool>Extract Mesh to generate the general shape of the shirt. After running the geometry through ZRemesher to create a base mesh with decent polyflow, I subdivide and sculpt drapery folds of varying size with the Dam_Standard and Clay Build Up brushes.



11 SCULPTING FINE DETAIL

I use a set of skin pore alphas and the Drag Brush Stroke to add pore detail to the highest levels of subdivision on the body. In key areas I use the Damian Standard brush to further enhance skin stretching and wrinkling. I follow the same process using wrinkle alphas for the shirt to generate fine drapery detail. I also used the Crumple brush to enhance the old, ratty appearance of the shirt.



12 FIBERMESH HAIR

Dividing the hair into polygroups provides ease of grooming. To do this I first divide the scalp into polygroups. I then mask off the scalp to designate the placement of the fibers. In Tool>FiberMesh preview mode I experiment with the settings and colour until achieving a natural looking crop of hair. I position the head 90 degrees to the camera and turn up the gravity, slicking the hair back to get a head start on styling.

Experiment with the settings and colour until achieving a natural looking crop of hair

EXPERT TIP

Community is key

In a highly collaborative field, networking and working with friends is not only vital but can often be its own reward.



13 GROOMING TECHNIQUE

As Anton Chigurh can attest, hairstyle can add a lot to a character. Slicking the Joker's hair back and giving him mutton chops – when combined with a Glasgow grin – adds a certain stylistic intentionality, which in my opinion makes him look totally nuts. ZBrush offers a set of grooming brushes specifically for FiberMesh. Going through polygroup by polygroup, I experiment by using a combination of Groomer Strong, Groom Clumps, and Groom Turbulence.



14 USING POLYPaint

The Joker's skin is very pale, traditionally the result of a chemical plant accident. I use muted colours with a range of smudge/dirt alphas in conjunction with the drag rectangle and airbrush strokes to give him a diseased, sallow appearance. I save a few images from the net as textures for the eyes, t-shirt graphic, and card deck, and use Spotlight to paint the colour information from the images directly onto the model.

A GIFT FROM HARLEY

The logo on the Joker's undershirt is a fun reference to his girl Harley Quinn and her nickname for him, Puddin'

ZTOOLS AND CUSTOMISATION

Some quick tips

In ZBrush terminology, when you load or import a model it's called a ZTool. The individual polygon parts that comprise a ZTool are called Subtools. On a separate note, the ZBrush interface is very customisable. I always use my own pop-up ZBrush menu which contains all of the functions I use most. To customise your interface, turn on Preferences>Config>Enable Customize. Hold down [Ctrl]+[Alt] to move items around. To create your own menu, click Create New Menu in Custom UI, give it a name, then you can [Ctrl]+[Alt] and drag items to it. You can also hold [Ctrl]+[Alt] and click on ZBrush functions to assign your own keyboard shortcuts.

EXPERT TIP

Ahead of the curve

New tools and techniques are developed every day. Don't get complacent; find out what they are and learn them, or risk falling behind your competitors.



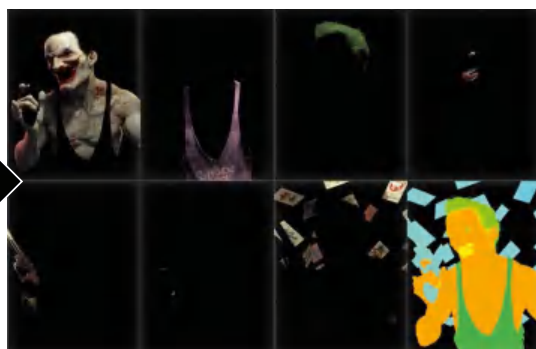
15 KEYSHOT PREP: UV MASTER

I use the UV Master plug-in to unwrap subtools, then designate ideal areas for seams with Enable Control Painting function. Activate polygroups, click Unwrap and UVs are created with seams along polygroup borders and control painted areas. I extract polypaint data to textures based on the new UV sets: select New From Polypaint in the Tool>Texture Map menu. With the t-shirt unwrapped, I can add finer details like subtle fabric patterns using Tool>Surface>Noise Maker.



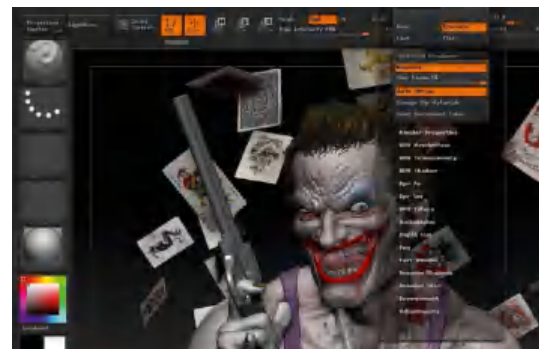
17 KEYSHOT EXPLORATION

In KeyShot, I experiment with different viewing angles of the character by creating cameras. KeyShot provides an extensive library of materials, which are easy to use – just drag from the library to the model. Dragging while holding [Alt] drops the material onto the model and retains its textures. I apply a translucent material to the body, metal for the revolver, plastic for the card deck, cloth for the shirt, and advanced for the hair.



19 KEYSHOT RENDERING

In KeyShot you can set up render passes with alphas, for each material. To create render layers, I select Add New Render Layer from the drop-down menu for each part of the model in the Scene editor. You can also generate object masks by checkmarking Clown Pass in the Render Dialogue. With my camera angle chosen, I set a high resolution and press Render to create my first batch of passes for use in Photoshop.



16 KEYSHOT BRIDGE

KeyShot is an external alternative to ZBrush's native BPR renderer and can be utilised through the ZBrush to KeyShot Bridge. To activate this I select KeyShot in the External Renderer rollout in the Render Dialogue. The power of KeyShot is in its real-time rendering facilities, which allows me to see an approximate result of the final image as I make changes on the fly. I hit BPR which sends all subtools to KeyShot.



18 KEYSHOT LIGHTING

I light the model using an HDRI image and light materials applied to sphere geometry, added to the scene. I create an ominous mood by tweaking the light material sliders, increasing contrast and rim lighting. It's easy to experiment with all kinds of different lighting set-ups in KeyShot, and while my mentor and I decide on a final story concept, I can quickly rearrange lights. I tune in on a lighting set-up I like and prep the model for render.



20 PHOTOSHOP IMPORT

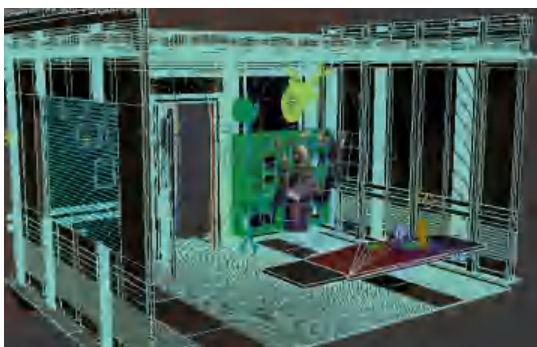
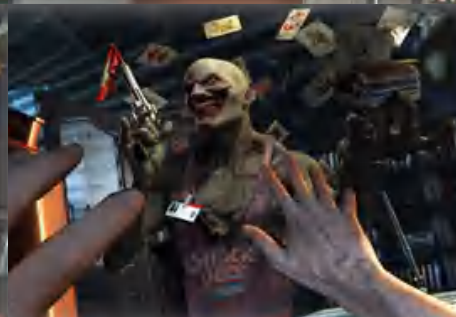
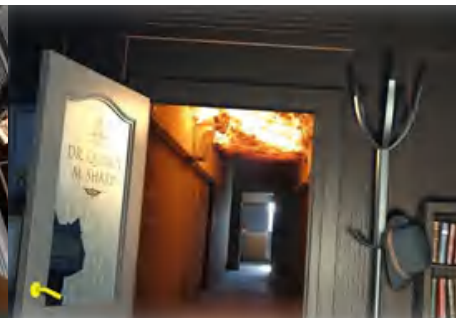
To set up my passes for composite and paint in Photoshop, I first open up all of the outputted KeyShot renders. From the File menu, I select Scripts then Load Files into Stack. This opens a dialogue where I can create a new document with all of my passes on separate layers, by selecting all of the open files and hitting OK. All of my passes are now lined up and arranged on separate layers in a single document.





21 PHOTOSHOP FIRST PASS

I quickly photobash a first painting concept by cutting and pasting elements from alleyway photography, setting the Joker lurking in a creepy dark alley. Not inspired with these results, I shift gears and with the help of my mentor, decide on a more dramatic new story direction: Setting the scene from the terrified point of view of Arkham Asylum's warden as the Joker – who has broken into his office and doused him with gasoline – assaults him with a flaming card deck.



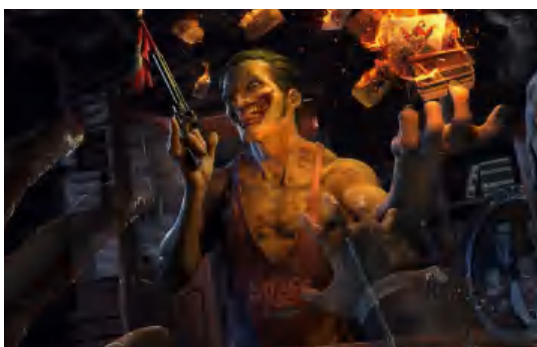
22 PLANNING IN 3DS MAX

I decide to quickly arrange a scene in 3ds Max instead of hunting for all of the photography I would need to photobash such a specific scene. I place geometry for everything in the warden's office and on his desk. To reference the Joker's placement in the scene, I map a KeyShot render to a plane. With my scene set up, I can rapidly move elements around, create approximate lighting, and fine tune my composition.



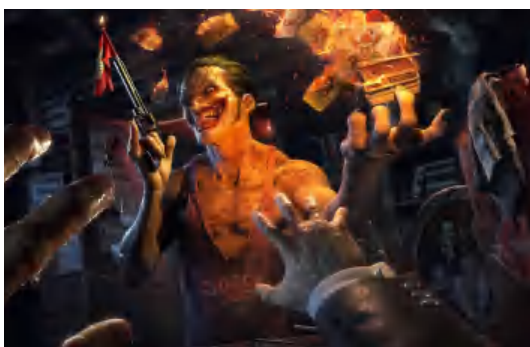
23 KEYSHOT ROUND TWO

After importing the office geometry into KeyShot, I set up a new camera overlooking the desk and replicate my 3ds Max lighting concept with light materials. I keep the materials on the geometry basic since the renders will only be serving as a base for the painting. I add a few new ZBrush elements to complete the story, like the Bang! flag for the revolver and the warden's outstretched, gasoline doused hands. I then render with layers.



24 PHOTOSHOP SECOND PASS

I blend Joker passes together, perfecting the lighting on the body. By painting a tiny flame above the Bang! gun, I create the fire source and convert the gun into an absurd trick lighter only the Joker would own. I photobash flames and build up layers of painted details where needed. By cutting/pasting sections from renders and photos, I can generate whatever pass is necessary (shadow, diffuse, or reflection) using Airbrush and Eraser tools.



25 COMPLETION

I collapse layer groups to individual layers, simplifying the document. I paint final details like hairs on the warden's hands, wet look for his sleeve, and miscellaneous bookshelf objects. I save the painting as a .png and overlay a subtle grain as a final step to unify and blend the composition. The end result – as compared to the Joker image from 2007 – is now a fully realised digital illustration with strength in its concept and drama in its story. ■

Save the painting as a .png and overlay a subtle grain as a final step to unify and blend the composition

TUTORIALS

Render a still life scene



ARNOLD FOR MAYA PLUG-IN

PART 1: RENDER A STILL LIFE SCENE

In the first of four render tutorials, *Bhaumik Patel* shares his advice for setting up the lighting for a still life render



ARTIST PROFILE

Bhaumik Patel

Bhaumik is a former tutor from Escape Studios who has created his own online mentored course, called Amaya Academy, with the goal of taking students from beginner to professional level in six months.

amayaacademy.com



TOPICS COVERED

Lighting
Geometry
Texture preparation

In this tutorial we will learn how to create a still life image using the Arnold for Maya plug-in. Still life images have been painted for centuries because they are a great way of showing off the ability to render different materials. We will be exploring Arnold's shaders to create different materials.

This is an example of the type of projects we have created at Amaya Academy. You can add or remove objects and change the composition and lighting to create a totally new scene for your showreel!

Arnold is a physically-based renderer. This ensures consistent results that are realistic, without much set up time. Because the results are predictable we can work with draft settings, which will look grainy, and then when

we are happy with our scene we can easily increase the quality to get a nice, smooth image with a predictable render time.

This issue we are going to set up the lights and geometry. When you deal with lighting in

of the object, in order to get interesting light and shade. The closer the light is to the camera then the flatter and less interesting it is going to look. We will then place our lights to the side of our objects which

You can add or remove objects and change the composition and lighting to create a totally new scene for your showreel

any renderer it's always good practise to be sure you work in linear colourspace for correct results. All of your textures and colour swatches that are in your scene will need to be converted to linear colourspace.

In our scene we will position an Arnold Area light to the side

will give us light and shade. We will use the IPR to get interactive preview renders while we work, as Arnold lights do not show lighting in the viewports.

Images, videos and setup files are in the online Vault to help.

For all the assets you need go to creativebloq.com/vault/3dw202

FOLLOW THE VIDEO

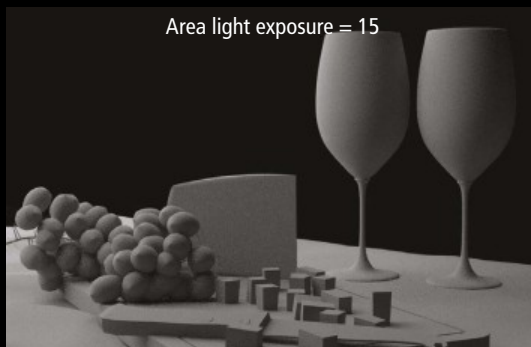
If you see the Play icon, use the link




 CLICK TO PLAY VIDEO
www.bit.ly/202-still-life

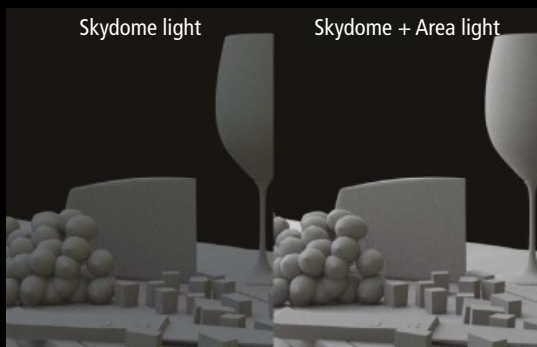
1 CREATE AREA LIGHT

There is no default light in Arnold so if you render the scene it will be black. We are going to start off by creating an Area light, so go to Arnold>Lights>Create Area Light. Notice how the icon is a square. The larger the light is, the softer your shadows will be. Set Scale to 5 and Exposure to 13. Using the Move tool, place the light to the side of the objects pointed towards them. Then render the scene.



2 ADJUST THE LIGHT

By default, Area lights are created with a quadratic falloff to simulate real lights, so expect to adjust the intensity if the light is far away. Let's adjust the light by using the IPR. In the Render View menu go to IPR>IPR Render>shotCam. You can now move and adjust the intensity of your lights and the render will update automatically. You can use Intensity or Exposure to adjust the light brightness. Exposure tends to work better for me as it's measured in f-stops.



3 MAP AN IMAGE

Let's create an environment to provide some fill light. Go to Arnold>Lights>Create Skydome Light. We will map it with an image. Select the light and click the checker next to Color. Go to 2D Textures>File then click on the Folder icon and pick 'background-low.jpg'. The light will take the colour from the texture and emit it. With Arnold's importance sampling of the image, bright light sources get more samples, which means less grain and accurate shadows.



4 EXPERIMENT WITH LIGHTS

Let's see how we can achieve different lighting by changing the image. Hide your Area light then select the Skydome light and click on where you connected your previous texture. Click on the Folder icon and choose another image. I'm using a HDR image from Paul Debevec called kitchen_probe.hdr. Experiment with different images. After you've finished unhide your Area light. I'm using 'background_low.jpg' from the online Vault as my skydome image.



5 SMOOTH OBJECTS

We can smooth our objects by using Arnold attributes in the shape node of the objects. Select all the objects – except the cheese cubes and chopping board – and press the down arrow key to select the shape nodes. Open Window>General Editors>Attribute Spreadsheet and in the All tab look for Ai Subdiv Type and click on it. Type in 1 for Catmull-Clark smoothing. Change Ai Subdiv Iterations to 2, and this will smooth it twice.



6 IMPROVE THE QUALITY

Let's improve the quality by increasing the samples on the Area light to 5. Notice the grain is gone in the shaded areas. We could also make the image even smoother by increasing the AA setting. Go to Render Settings>Arnold Renderer>Sampling>Camera AA. This will exponentially increase render times, so it's best to tune the right settings. In the next tutorial we will start setting up shaders. ■

LIGHT ATTRIBUTES

Arnold uses the Exposure Attribute in lights, which is a term used by cinematographers in the real world

EXPERT TIP

Smoothing objects

When smoothing objects in Arnold, using the regular Maya shortcut key of 3 does translate correctly. However, it's best to keep your viewport display fast and responsive by smoothing at render time using the Arnold smoothing attributes, especially in larger scenes. You also get more options for how UVs are smoothed.

Let's see how we
can achieve
different lighting
by changing
the image

LIGHT SAMPLES

Always increase your light samples before increasing AA samples, in order to reduce grain

TUTORIALS

Lighting and compositing tips



ARTIST PROFILE

Devon Fay

Devon is a senior environment artist at Infinity Ward as well as an instructor at the Gnomon School of VFX. He has five years' experience in the video game industry, with studios such as Blizzard and Neversoft.
www.dev-xyz.com

 MAYA | V-RAY | PHOTOSHOP

SPEED UP YOUR LIGHTING AND COMPOSITING

Devon Fay talks through some important tips to help add speed and flexibility to your lighting and finishing workflow


FOLLOW
THE VIDEO

www.creativebloq.com/vault/3dw202

TOPICS COVERED

- ▶ Basic V-Ray light types
- ▶ V-Ray render elements
- ▶ Maya render layers
- ▶ Photoshop to finish your piece

Lighting and finishing is probably the most important aspect of making our final image look great. By adjusting lighting, we set the mood and emotion of a scene. The lighting ties our other hard work together. It finishes our composition, helps with the focal point, and creates an overall appealing image.

Unfortunately, the lighting and finishing (compositing) portion of the image creation process can be slow and cumbersome. We can save massive amounts of time with the right planning and strategies, no matter if we're working on just a cool personal image for our portfolio, a concept for a game,

or an environment for a cinematic. We can achieve a great look, but also do it with efficiency in mind.

I'll give an overview of some important steps to speed up lighting, rendering, and finishing workflows. Because of V-Ray's speed and easy-to-follow layout, I use it primarily for all my projects and so will refer to it often.

We'll go over the basics of each light type in V-Ray. Then an overview of how to best set up render passes and layers in our scene in Maya for efficient post-processing in your compositing software (in this case, Photoshop). Lastly, we'll go over techniques to get the most out of our renders

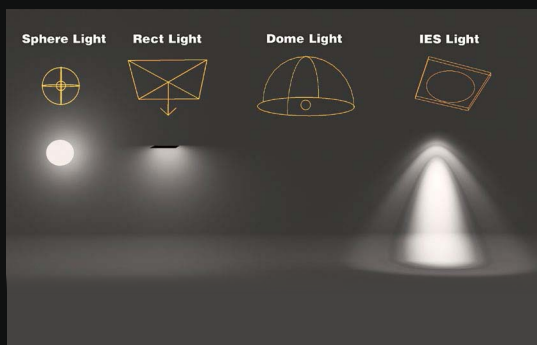
in Photoshop and really take our image to the next level.

When finishing a scene, be sure you're getting the most out of the tools. By planning ahead, you give yourself the best opportunity to adjust in 2D. Even though the rendering process is slow, by using V-Ray and Photoshop, and properly understanding how and where you can gain efficiency, you can gain a lot of control over the look of the final image while at the same time gaining speed.

Download my video from the online Vault, and look for Gnomon training coming soon.

 For all the assets you need go to creativebloq.com/vault/3dw202

HANDY SOFTWARE
Increase your speed and gain control over the look and feel of an image with software like V-Ray and Photoshop



1 BASIC V-RAY LIGHT TYPES

Before lighting a scene, make sure you understand the basic light types V-Ray has to offer. This gives you the information required to make the best decisions for the needs of the scene, increasing the overall speed of the lighting and finishing process. The four V-Ray light types are: Sphere lights, Dome lights, Rect lights, and IES lights. Each has a specific style of light and should be used in the appropriate circumstance. See the boxout for more details.



2 SPHERE LIGHTS

These are your basic point light. Use these for localised light that casts light in more than one direction. I use them in my scene mostly for lanterns, worklights, and bulbs without any cases around them to set points of interest in the scene.

BE CREATIVE Experiment with lights

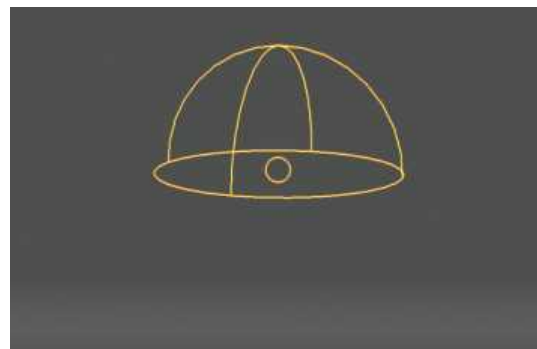
Although useful to know the basics of V-Ray lighting, experiment with all the light types in different scenarios. When lighting a character, you may find a Sphere light is not quite giving you the rim lighting you need to separate them from the background. Here it would be appropriate to add the rim with an extra Rect light. Lighting for theatre, film, TV, and CG has always been about using techniques to create an ideal scenario for the scene, meaning there's usually a lot of forgiving of light angles, intensities, and types to get the best look. Don't be afraid to experiment to create the most appealing scene possible.

V-RAY LIGHTS

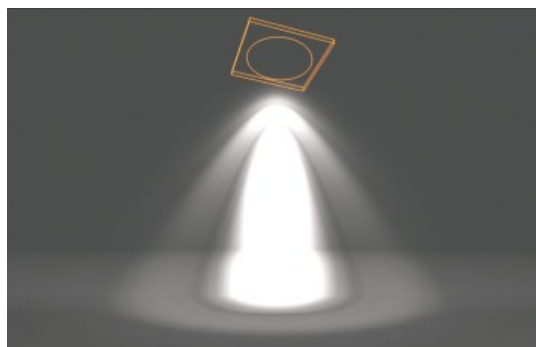
There are four types of lights in V-Ray: Sphere, Dome, Rect and IES. All of which have a specific style

**3 RECT LIGHTS**

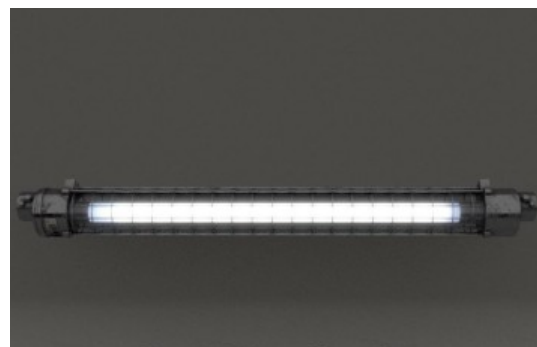
I use these lights for any light that has a large surface that casts light in one direction. They are similar to a basic spotlight, but the shadows tend to be softer and more natural looking. In the alley image I use these a lot for the fluorescent lights in all the shops, as well as most of the key and rim lights.

**4 DOME LIGHTS**

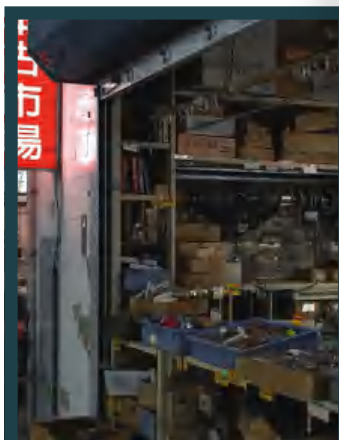
Typically, I use these lights as my ambient light or sky light. It's used to simulate the sky, or the general surroundings of the scene. A texture or HDRI can be loaded in to help add realistic and accurate lighting. I add a classic screenshot from Blade Runner as my Dome light. This isn't an HDR image, but it adds a nice amount of ambient light that I feel is needed for a night scene such as my sci-fi alley.

**5 IES LIGHTS**

These give interesting IES (Illuminating Engineering Society) profiles when casting their light. They are typically used to help add interest and realism to your cast light and shadows. Many manufactured lights in the real world cast a detailed profile like that shown in these IES lights. I don't find a need for these lights in this specific scene, so they're unused.

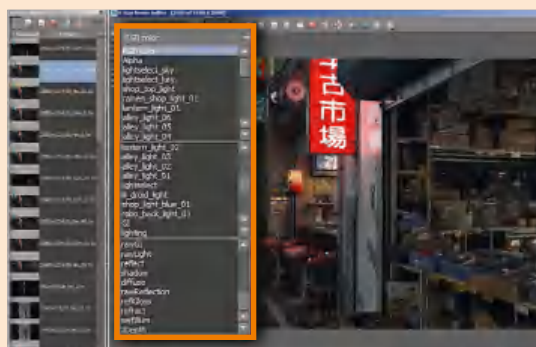
**6 SELF-ILLUMINATED OBJECTS**

These lights have self-illuminated materials on them. By default, they don't cast actual shadows (you can set this up, however) but they will affect the reflections and global illumination. I use these for my neon lights, light bulbs, fluorescent lights, lit buttons, and holograms. You can also use these to help with compositing glows.

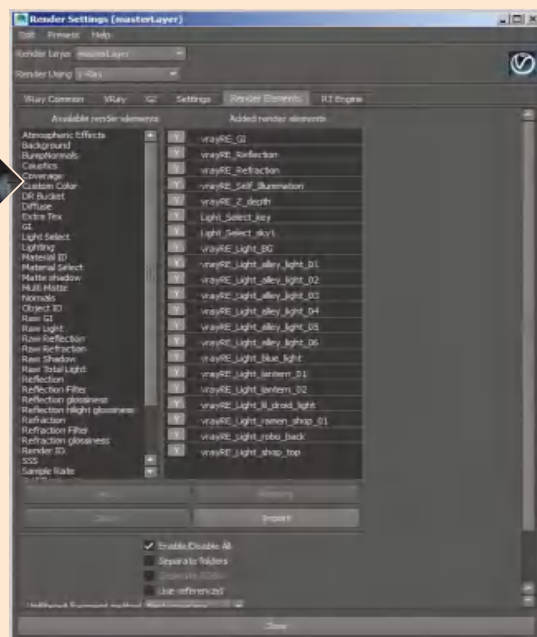
**OVER-LIGHT YOUR BEAUTY IN MAYA**

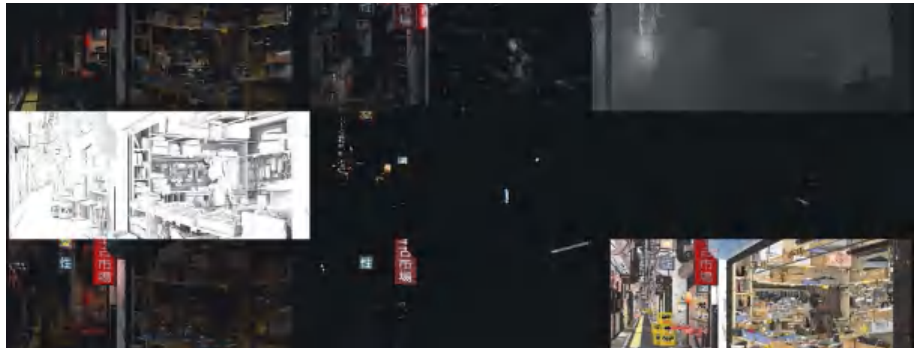
More is better

When lighting the scene overall, I tend to over light it in Maya. What do I mean by this? I try to add lights in all the areas I think realistically they should be, for example in all the stores and lamps. This makes the final beauty render look flat overall, and not interesting in general. Remember, we plan on splitting all of our lights into separate V-Ray Light Select layers. So even though our final beauty render looks flat, we'll be adjusting all of that in our final composition.

**7 OPTIMISE YOUR WORKFLOW**

Render layers and render elements can be used to help speed up lighting adjustments and experimentation. Giving yourself more information to adjust in Photoshop improves iteration time, as well as the overall look of the image. V-Ray can automatically split the render into multiple render elements, or render passes. The elements are very easy to set up, and are useful to use the entire time during lighting, all the way up to the final output.



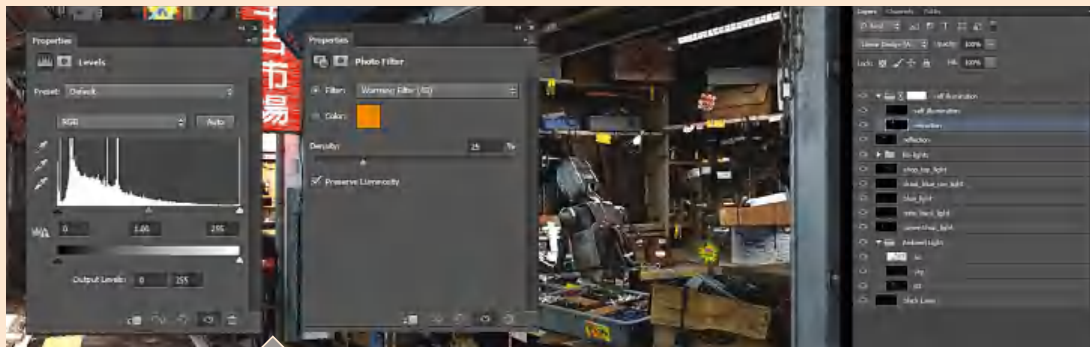


8 DIAGNOSE ERRORS

By looking at the different rendered outputs, you can notice issues early on, like lights not casting proper shadows, material reflection issues, and errors with the global illumination. By quickly being able to see which pass has the error, it makes it much quicker to find the problem and therefore fix it.

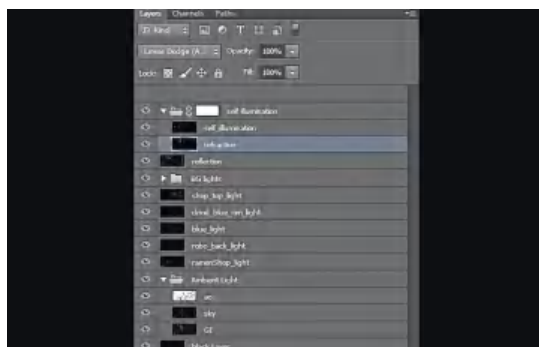
9 GRANULAR CONTROL

Breaking the render into multiple layers gives granular control over the final composition. But when it comes to combining all the render passes together in a program like Photoshop, don't over-complicate the document with too many passes. Use V-Ray Light Select layers for every light in your scene; Reflection pass, Refraction pass, Self Illumination pass, Global Illumination pass, and ZDepth give control over the final image. You can mix these in with render layers.



10 RENDER LAYERS, USE THEM

Maya lets you use render layers to split the scene into different custom renders. Render Layers can be used to create passes that V-Ray doesn't offer by default: ambient occlusion, material override, and finer granularity for specific assets. So you can use all the normal V-Ray passes, but also render an additional pass for a specific asset, such as a hologram. By doing this you separate the hologram, giving more control over how it looks in the final composite.



11 PHOTOSHOP SPEED

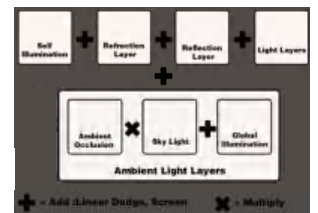
After my renders are finished, it's time to add them all back together into Photoshop. At the base, I start with our Sky light layer (the main ambient light, usually done with a V-Ray Dome light). The majority of my render passes will then be added on top, using Linear Dodge. The layers that add on top of each other are: the Global Illumination layer, all of the light select layers, the Self Illumination layer, the Reflection layer, and the Refraction layer.

12 MORE PHOTOSHOP LAYERS

The only other layer that needs compositing to start adjusting is my ambient occlusion layer. This layer is not set to Linear Dodge like the others; it's set to Multiply. The key thing to remember is to multiply this only over the global illumination and sky light layers. These layers represent our ambient lights. Remember, it's called ambient occlusion, meaning it occludes the ambient light. If this was multiplied to all of the key lights, it would look wrong.



QUICK TIPS IN PHOTOSHOP



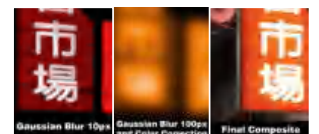
ONE IT'S ALL JUST MATHS

By simply adding and multiplying the proper layers, in the proper place, you can set yourself up for a perfect composite. Download my image guide from this issue's Vault for a basic overview of how to add and multiply layers to affect your image.



TWO REMEMBER PERSPECTIVE

Make sure to warp your textures into the proper perspective while placing them. Your whole image will seem off if you skip this step. I imported a texture from www.cgtextures.com, used Warp to place it and Multiply to fix.



THREE USE MULTIPLE BLUR VALUES AND HUES

By using more than one blur value, and more than one hue, you can vastly improve the overall appeal of your glows. Here I've multiplied my Gaussian Blur correcting for the final result.

VITAL STEP

The initial compositing is hugely important to create the general look of our image

**13 INITIAL COMPOSITING**

This step is the single most important step for achieving the overall look and composition of my scene. After the layers are combined and laid out, it's time to tweak and composite them and create the general look of our image. I do this by turning on and off the Light Select layers that I do and don't want. This is essentially turning on and off whole light contributions to the scene.

**14 ADJUSTING THE LIGHTING**

Once I have decided which lights I want on, it's time to adjust the intensity and colour of them. I like to use a mix of Levels, Photo Filter (because it's easy), and Hue/Saturation as adjustment layers. With these simple adjustments layers, we can achieve a lot of different looks. We can add a warmth or cooling to a single light, as well as adjust the overall intensity of each light individually. As an example, I took the light from the ramen area and warmed its overall colour.

**15 ADD TEXTURE DETAIL**

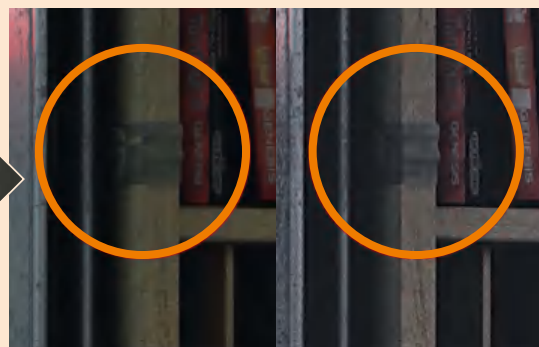
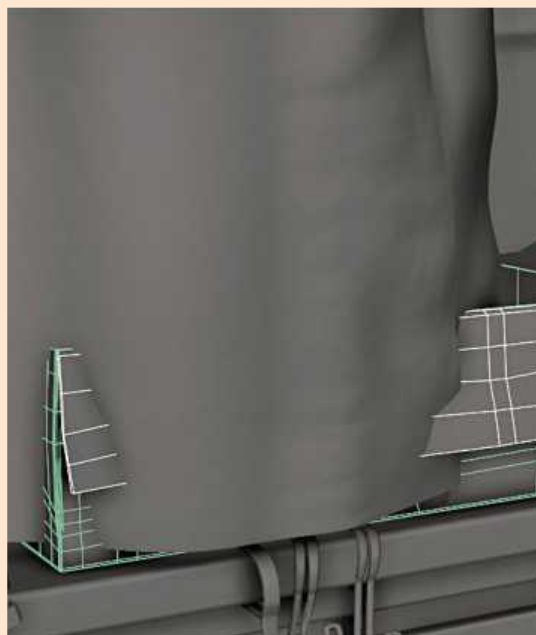
I learned from my years on the matte painting team at Blizzard that texturing your renders in Photoshop is much faster than texturing everything uniquely in Maya. Here, if I were to uniquely UV and texture every asset, it would take a huge amount of time. By utilising some well-built tileable materials and quick UVs – mostly using Maya's Automatic Mapping tools and then adding unique textures directly in Photoshop – you can increase iteration time immensely.

16 CONTINUE DETAILING

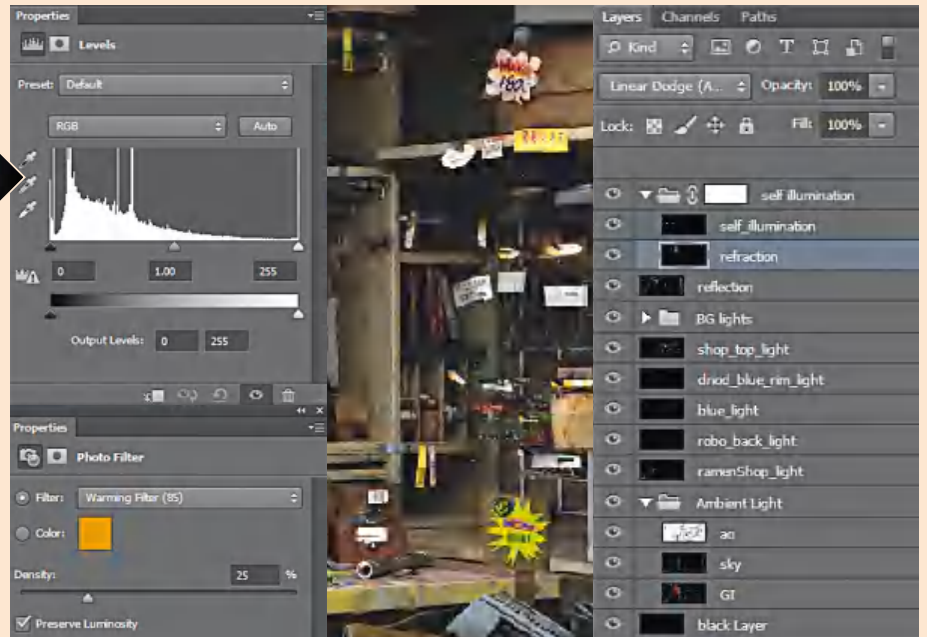
These Photoshop texture techniques work best when dealing with single-frame concepts, but can still be used in production by reprojecting the texture details back on in 3D. I mostly keep to overlaying and multiplying my texture details in Photoshop. This keeps it easy to understand, and easy to colour-correct properly. I use grunge, stain, and worn textures to add detail to all the concrete, wood, and metals.

**USING PHOTOSHOP***Save yourself some time*

A background object may have some bad geometry, which causes a shading error. If working in Maya, normally we would have to find that object, fix the geometry, usually fix the UVs, and then re-render the whole scene. If it's something that is easily fixed in Photoshop, it can be as easy as using a single Clone tool brush stroke to fix that area. These little fixes can add up to massive time savings.

**17 FIXING ERRORS**

When creating complex scenes in CG, errors are unavoidable. Things like bad smoothing groups, clipping geo and stretched textures can ruin renders. When dealing with this workflow, we can decide which errors need to be addressed in Maya and V-Ray, and which can be painted over in Photoshop. This can exponentially increase your iteration time, because even small errors can take a very long time to fix in the pipeline if we were to have to re-render.



18 FINAL TOUCHES

In Photoshop I like to start by adding glows to my lights and self-illuminated elements. This is easily done by taking the self-illuminated pass and using a Gaussian Blur, then adding Linear Dodge or Screen back on top. Next I like to add an overall photo filter at a low intensity to my image. This helps to unify the image. Also, I do overall level adjustments. This helps dial in the final exposure for the overall image.



19 CHROMATIC ABERRATION

The next move is to add some chromatic aberration to the image. This is a technique that is, I feel, overused in recent years. It has an appealing look, but should be used delicately. I like to use it only on my lights and self-illuminated parts. Using it in this way helps add an interesting, appealing look to the image, but stops it from being over the top.

20 ADDING DEPTH OF FIELD

Now let's add depth of field. It's important to use your ZDepth pass for calculating the correct depth of field. Unfortunately, Photoshop's default options for depth of field aren't the strongest. I use a third-party plug-in called Lenscare by Frischluft. It's very reasonably priced, easy to use, and looks fantastic. The main thing to look for when adding depth of field is a realistic bokeh effect. This effect best simulates how cameras in the real world deal with depth.

MAKE IT REALISTIC

When adding depth of field it's important to look for a realistic bokeh effect



21 USING LENS FLARES

Now I need to add the lens flares. As mentioned before, lens flares are easy to overuse. So we should take care to use high-quality lens effects on selected lights. Try to stay away from adding lens flares to every light source in your images, and never use Photoshop's default lens flare plug-in, as it doesn't look realistic. ■



ZBRUSH 4R7

CREATE A COMPELLING ALIEN CHARACTER

Madeleine Scott-Spencer shows how to create an alien using ZBrush 4R7, including many of the new tools only available in this new release



ARTIST PROFILE

Madeleine

Scott-Spencer

Madeleine is an artist at Weta Digital in New Zealand where she recently completed five years' work on The Hobbit trilogy. Madeleine uses ZBrush extensively in her work.

maddiemonster.com

In this tutorial we'll create a fully costumed alien creature using ZBrush 4R7. ZBrush supplies a plethora of powerful sculpting, painting, and modelling tools and with the release of ZBrush 4R7 we have even more amazing new options for creating geometry.

In this tutorial we will look at foundation sculpting tools and techniques for creating a great alien. We will also look in depth at some of the newest ZBrush tools for creating complex geometry in ways that were unthinkable before inside ZBrush.

We will begin from a basic polygon sphere and look at

how to push and pull that into an interesting overall shape for our character. Sculpting requires more than just moving shapes around, so we will also be thinking about the overall form and silhouette of the creature and how to make that as interesting as possible.

Silhouette is one of the most important aspects of creature design, as the overall graphic shape is the first thing anyone sees of your work. It's that initial read that helps the eye and brain make sense of the shape. The more iconic and compelling this is, the more memorable the creature.

We will also look at using some of the new ZBrush modelling tools available in 4R7, in order to create custom elements for the alien. NanoMesh and ZModeler are two of the new – and most powerful – additions to the ZBrush toolset we will be using in this tutorial.

ZModeler is a polygon modelling tool which allows you to directly extrude, split, duplicate, and further manipulate polygon objects in ZBrush. NanoMesh is a powerful instancing tool which works in conjunction with ZModeler. Let's get started!

For all the assets you need go to creativeblog.com/vault/3dw202

EXPERT TIP

Using the Smooth brush

When sculpting organic forms always smooth as you go. I constantly smooth after every few strokes with the sculpting brushes. This helps you create better form by avoiding the 'lumpy' look associated with beginner ZBrush models.

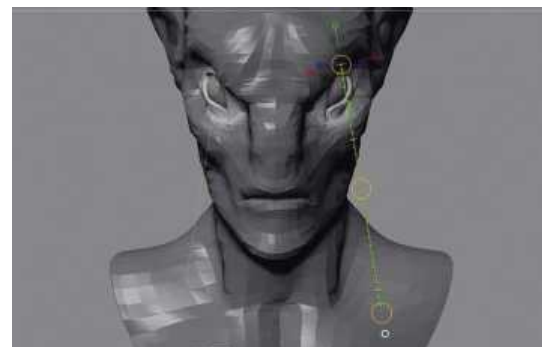
TOPICS COVERED

- Form and silhouette considerations
- Using DynaMesh with ZRemesher
- Costumes using topology tools
- ZModeler costume elements
- Complex objects using NanoMesh



1 ROUGH IN BASIC SHAPES

Starting from a generic head model I begin to rough in the shapes of the creature. I rely heavily on the Move and Clay Tubes brushes. I add two subdivisions at the maximum for this stage and sculpt no detail at all. This stage is about getting the basic shape of the creature's head in place. I want to make sure the shape has a compelling silhouette. I try and create a form which repeats a similar curved arc as a visual theme.



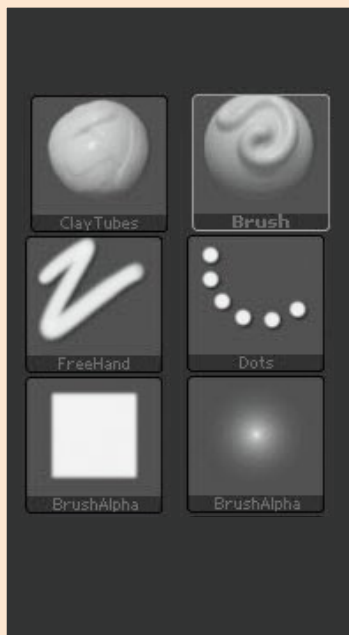
2 FURTHER REFINEMENTS

I further refine the shapes of the face. I want to create a sense of uncanniness to offset the humanity. I do this by rotating the eyes into a more extreme angle. Isolate the eyes with a mask then use the Transpose Rotate tool to rotate them around the Z axis. This creates an eye that is inhuman but relatable. I try to think of ways I can make the creature unusual while retaining an integral relatability. Tweaking human facial norms in this way is one technique.

COSTUMED CREATURE

ZBrush 4R7 features powerful sculpting, painting and modelling tools which were used to create this alien





3 REFINE FACIAL ANATOMY

It's important to maintain a sense of skeletal and muscular anatomy under the flesh, so the creature seems realistic. A solid sense of underlying anatomy, no matter how alien the creature, will make it appear authentic. I focus here on the cheekbones and the bony structures of the eye (zygomatic process and zygomatic arch). I also use the Dam_Standard brush with the Z Intensity dialled back to about 50 per cent to etch in major folds and wrinkles in the skin.

EXPERT TIP

Drawing masks

When drawing masks here are some useful hotkeys: [Ctrl] click the masked area to feather the edge of the mask. [Ctrl]+[Shift] click to sharpen the mask edge. [Ctrl] click on the background to invert the mask entirely.



4 BIFURCATE THE JAW

As I try to create a more interesting design I decide to bifurcate the lower jaw. This will allow me to sculpt in some interesting anatomy for the jaw but also expose the teeth and gums in an interesting way. Use the Dam_Standard brush to slice the lower jaw in and the Move brush to shape the resulting forms. I try to continue to echo the curved forms we saw in the head already. This repetition of shape throughout the figure is called rhythm.



SET THE LIPS

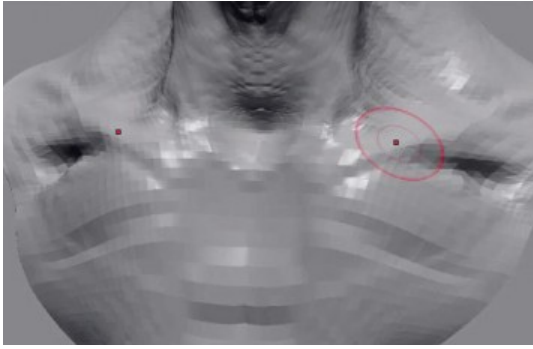
The Standard brush is also used to extend some fine wrinkles from the lips up and onto the face

5 SCULPTING THE LIPS

When sculpting the lips it's important to capture the soft fleshiness of the lips, as well as the structural muscular forms of the orbicularis oris. Using the Standard brush with Alpha 01 dialled down, sketch in the ledge of the lip (the hard line that outlines the upper lip). This line is actually the edge of the muscle where it meets the fleshiness of the lips. Use the Inflate brush to mass in the soft pillows of the lips and the Standard brush to etch in the striations.

6 CREATE WRINKLES

The Inflate brush is very powerful for creating fleshy forms. Here I use the Dam_Standard brush to extend the lower jaw split into the neck. Using the Standard brush with Alpha 01 skin wrinkles are carved radiating out from the split. Use the Inflate brush to pucker those wrinkles and the split to give them a supple, fleshy appearance. You want the skin to feel like it has volume and is pressing against itself. I will dial back my brush intensity to 50 per cent for these.



7 SCULPT TORSO ANATOMY

Use the Standard brush again with Alpha 01 to sculpt the anatomy of the chest and shoulders. Sketch in the clavicles and be sure to get their characteristic S shape. Do not neglect the infraclavicular fossa, the depression found beneath the collar bones and next to the shoulders. This helps to suggest a muscular yet sinewy anatomy. Build up the pectorals with the Clay Tubes brush and suggest the ribs and sternum again with the Standard brush.



8 ADD BODY PARTS

To add arms and a torso go to Tool>Geometry and enable DynaMesh. You will need to turn up the DynaMesh resolution to maintain all the detail. Set the slider to approximately 800 and turn on the Project button. Once the Resolution slider is set click the DynaMesh button. Because we have subdivision levels, ZBrush will ask to freeze them in a pop-up menu. Click No on the pop-up box. The mesh will now be DynaMeshed and you should retain your details.



9 USE MESH INSERT

In DynaMesh mode we can use the Insert brushes to add parts. From the Brush menu select IMM_BParts brush. This inserts body parts into a DynaMesh. Press [M] to bring up the menu of available insert meshes. Select the arms. Now click and drag on the shoulder of the character. Release the brush; the arms are unmasked while the rest of the model is masked. Move them into position with Transpose Move, Scale and Rotate (hotkeys W, E and R).



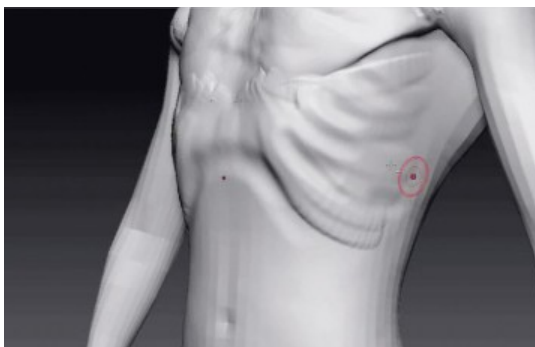
DYNAMESH TIPS

Using IMM brushes

When you are in DynaMesh, ZBrush will automatically rebuild the underlying mesh based on the shape you create. This allows us to use the IMM brushes to glue parts of models together then dynamically remesh (DynaMesh) them into a new volume. From the Brush menu select any of the IMM brushes to insert multiple meshes.

Pressing [M] while you have an IMM brush selected will show a menu that displays the meshes available for insert. You can make your own IMM brushes whenever you have a model with multiple subtools open. Go to the Brush menu and press the Create InsertMultiMesh button.

Inserting meshes is simple; select a mesh from the list and click-drag on the model where you want to insert it. Usually you'll need to switch to Transpose to shift the mesh into a more exact position. When using the IMM brush the model you're drawing on will be masked to facilitate transposing and manipulating the insert mesh. When ready to glue the parts together hold [Ctrl] and click-drag on the background once to clear the mask, then again to execute DynaMesh. This incorporates the parts together and dynamically remeshes the volume.



10 ARMS AND TORSO

With the arms placed on the model where you want them to go, hold [Ctrl] and drag the cursor over the background. This will clear the mask. Repeat the [Ctrl] click-drag stroke off the model and this will cause the mesh to DynaMesh, effectively gluing the arms in place. The arms are now unified and part of the overall mesh of the character. Repeat the process by pressing [M] and selecting the torso. You can now add a torso to the model, extending down to the waist.



11 SUBDIVISION PROCESS

We want to restore our model to a ZTool with multiple subdivision levels, but retain details and newly inserted parts. Subdivision levels are important when you pose or animate the figure and it's easier to sculpt when your model has multiple levels of resolution. To do this duplicate the model. Go to Tool>Subtool>Duplicate. Hide this copy. Now use ZRemesher to automatically remesh the creature, creating a low poly base mesh for animation and posing.

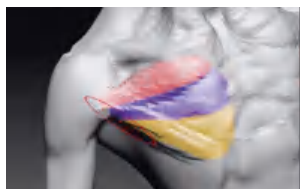
SCULPTING TIPS

SCULPTING THE TORSO



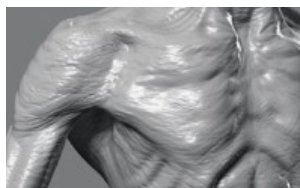
ONE START SKETCHING

Sketch in the basic forms of the torso using the Clay Tubes brush. This is an ideal brush for establishing form and flow. If you disable the alpha you can create great soft subtle shapes. Start by blocking in the deltoids, pectorals, and ribcage.



TWO SCULPTING MUSCLES

Muscles have multiple sections, often visible in more sinewy creatures. The deltoid has three sections or heads, so do the pectorals. I colour coded where I've sketched in the pectorals using three distinct strokes. Keep this structure in mind so it remains visible beneath the skin of the final creature if that degree of muscularity is appropriate.



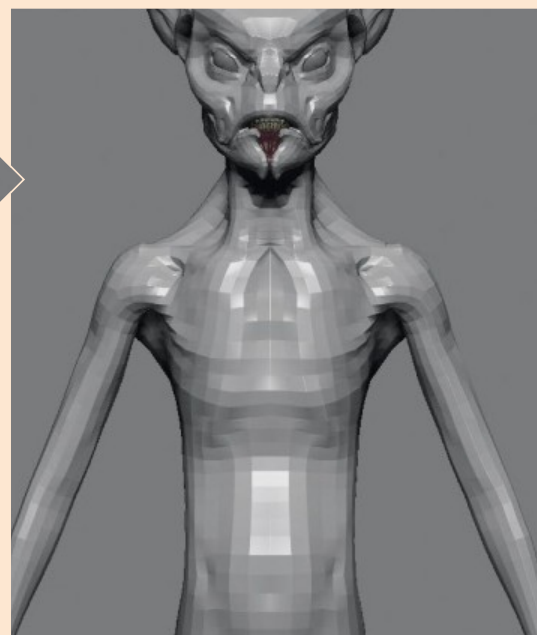
THREE SKETCH LANDMARKS

I use the Standard brush with Alpha 01 to sketch in the recesses between muscles and in bony landmarks. This is a process of catching light and shadow on the surface to accentuate landmarks. You can see how I accentuated the ribcage, especially the thoracic arch at the top of the abdomen. I've also been careful to accentuate the sweeping arc of the collar bones, these are important bony landmarks and getting the right gesture to these lines is integral to maintaining the beauty of the structure of the neck. I've included sculpting footage of this process.



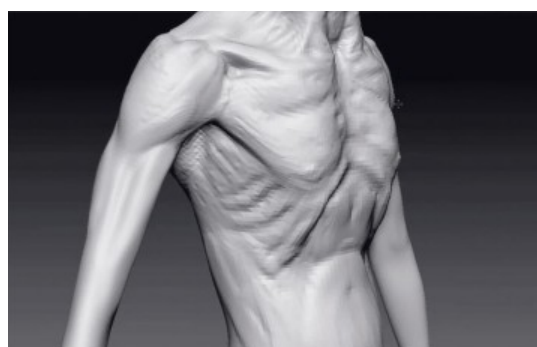
12 USING ZREMESHER

Open Tool>Geometry>ZRemesher. This is ZBrush's automated retopology tool. Set the Target Polygon Count to approximately 2. The number is read in thousands so this will result in a 2,000 face mesh. Press the ZRemesher button and ZBrush will rebuild the model to the resolution supplied. When it's complete you will have two tools; a copy of your high-res, which is hidden, and your current ZTool, a low-res poly model.



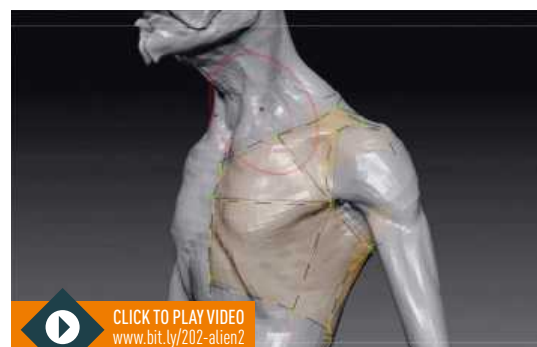
13 REPROJECTING DETAILS

Make the subtool visible again but keep the low-res as the active ZTool. Add two subdivisions to the low-res with the [Ctrl] D hotkey. Open Tool>Subtool>Project and press Project All. This will project the current ZTool onto the high-res. Add another subdivision and repeat the process until there's a multiple subdivision model with the original details. This model looks identical to the DynaMesh but retains multiple subdivision levels for posing.



14 SCULPT TORSO ANATOMY

I return to the Clay Tubes brush in concert with the Standard brush to sculpt the anatomy of the torso. Use the Clay Tubes brush with no alpha to build up the muscular forms softly. I will then create the forms of ribs and the areas between muscles using the Standard brush with Alpha 01. This finer brush is great for sketching out muscle flow. Smooth the shapes back with the Smooth brush and repeat the process to gradually build up organic shapes.



15 MAKE THE ARMOUR VEST

We will use ZBrush's Topology brush to create the metallic vest. Duplicate the character and step down to the middle of the subdivision levels. This will be a proxy mesh on which we will build the new topology. Go to Tool>Geometry and delete the higher and lower buttons so you are then left with just a single subdivision level. Turn off visibility on the other copy of the mesh. From the Brush menu select the Topology brush.





16 DRAW NEW TOPOLOGY

Turn on X Symmetry and draw a midline down the centre of the front and back of the figure. Using the Topology brush, draw in a curve network of all quads. As a quad is completed ZBrush will automatically preview the face for you. To delete a stroke hold down [Alt] and draw a line across the curve you want to delete. Once you have completed drawing your topology press [Alt] and click on the model – your mesh will then

be generated. If it appears too thick, undo and lower the draw size of your brush then [Alt] click again. When you are happy with the thickness of the geometry hold [Ctrl]+[Shift] and click on the mesh to hide the proxy body you drew on. Only the new topology should be visible. Go to Tool>Geometry>Modify Topology and click Delete Hidden to remove the proxy and leave only the new topology. This can now be divided and then detailed.

EXPERT TIP

Creating vents

You can create vents using the Planar brush with the Brush>Depth>Embed slider set to about -20. Select the square alpha 28 and under the Alpha menu turn up the H Tiles slider under Modify to 32. Set your stroke to DragRect. Now when you use the Planar brush you will create a venting pattern. Try using X Symmetry for a diamond mesh pattern.



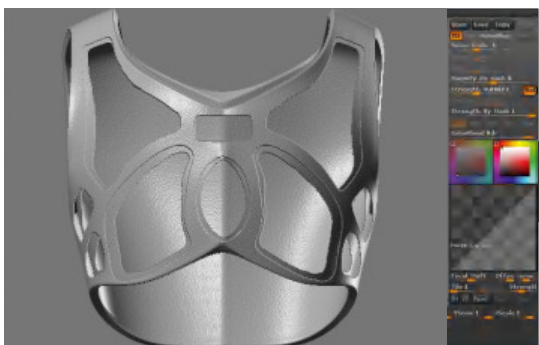
17 CREATE THE MANTLE

The mantle and collar are created using the exact same process. Remember to duplicate any geometry you want to use as a base to draw topology. With the copy selected, delete the subdivision levels and you can now use the Topology brush to generate new costume parts. We will use the mantle created here as a base for a chainmail costume part.



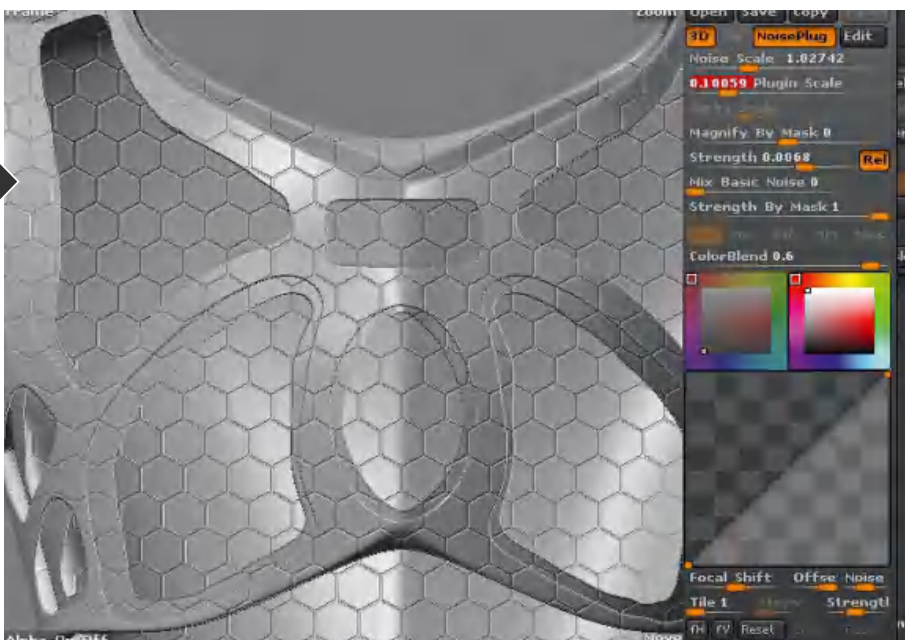
18 DETAIL THE ARMOURD VEST

The vest is detailed using a combination of Group Loops and the NoiseMaker plug-in. Subdivide vest geometry several times, then delete lower subdivisions. Mask out the areas to isolate as panels. Go to Tool>Polygroups>Group Masked to create polygroups from masked areas. Click Tool>Geometry>Group Loops to cut edge loops around those polygroups. These can be isolated with masks and extruded using Tool>Deformation>Inflate slider.



19 CREATE HEX TILE PATTERN

Mask the entire vest except the largest polygroup. Open Tool>Surface>Noise. Within the plug-in click NoisePlug>NoiseMaker submenu. From these noise presets select Hex Tile and click OK – a hex tile pattern is applied. Lower the plug-in scale slider until tiles are visible, adjust the strength slider to amend how far in or out they extrude. Turn Mix Basic Noise slider to 0 to remove the random noise pattern overlay. Click Apply to Mesh to bake noise into the model.



USING NANOMESH

MASTER NANOMESH CREATING A BRUSH



ONE CREATE THE BRUSH

Create an Insert Mesh brush by selecting a ZTool and under the Brush menu press the Create InsertMesh Brush button. Your current brush is a Mesh Insert brush. Convert to a NanoMesh brush by pressing the Create NanoMesh Brush button. Open the model you want to grow the NanoMesh from and select the ZModeler brush to access NanoMesh.



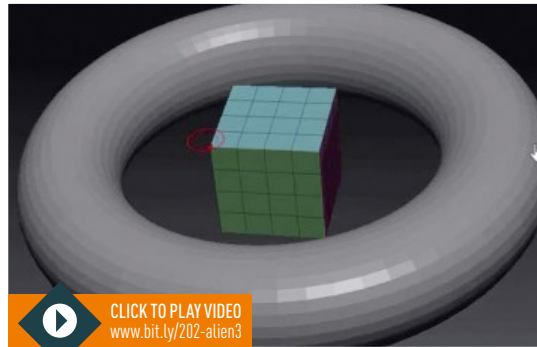
TWO INSERT NANOMESH

With the mesh open in Edit mode press spacebar for the ZModeler menu. Select InsertNanoMesh and set the target to Polygroup All. This inserts the NanoMesh into each visible polygon. Control the particulars of placement and size with Tool>NanoMesh menu. Press the Freeze Placement button and insert another. Turn on Hide Others (under NanoMesh menu) to see new inserts.

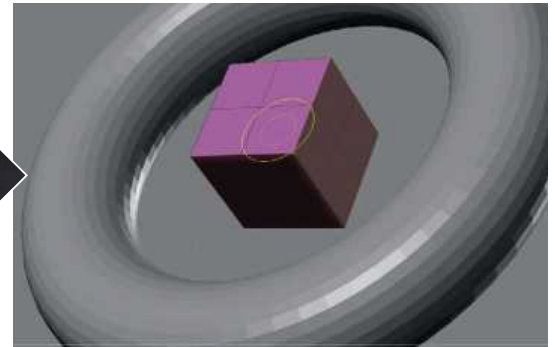


THREE USING NANOMESH

Select the IMM Machine Parts brush. Go to the Mesh menu and select the Philips head screw top. Press Create NanoMesh. Draw this mesh on the surface. In the NanoMesh menu set H and V tiles to 4 and pattern option to corners. Turn off Hide Others to show your NanoMeshes. To convert NanoMeshes to standard geometry press the Convert BPR to Geo button under the Geometry menu.



CLICK TO PLAY VIDEO
www.bit.ly/202-alien3



20 CHAINMAIL MANTLE

We will now use ZModeler and NanoMesh to create a chainmail style mantle for the costume. We will create a small mechanical unit with ZModeler then instance it along with a polygon ring model across the entire surface using NanoMesh. This will create a complex and interesting futuristic chainmail garment. Begin by selecting a new polygon star primitive from the ZBrush Tool menu. This is just the default ZBrush placeholder model. With the

star selected go to Tool>Initialize>QCube. This will create a nice simple polygon cube to use as a starting point with ZModeler. Note: because I want this piece to match in size to the polygon ring, I load the ring as a subtool to help in my modelling. The idea is for these mechanical parts to be the connecting units between the chain rings, creating a deeper more complex layer of detail. See the accompanying video for more information.

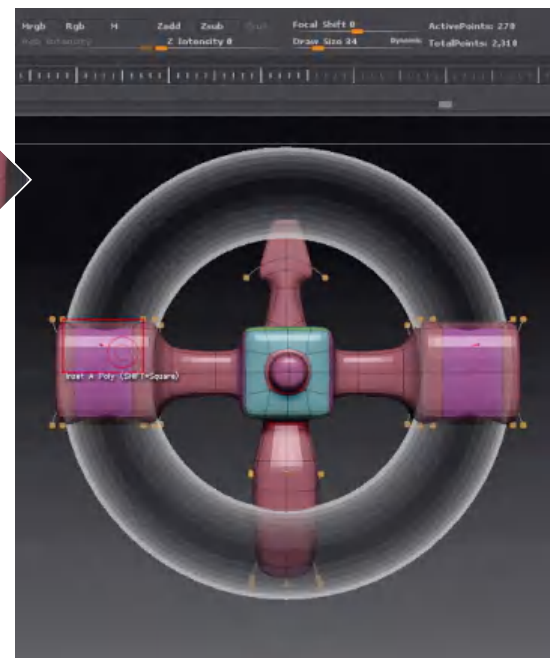
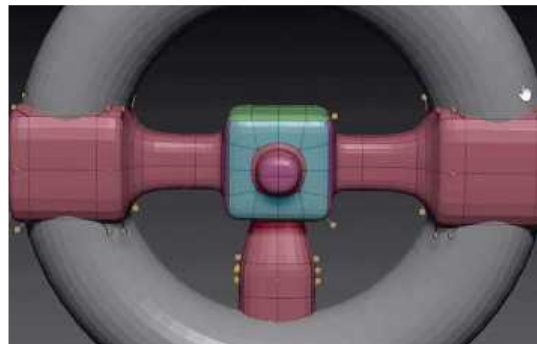
ZMODELER	POLYGON ACTIONS
Add To Curve	Inflate QMesh
Bevel	Insert NanoMesh Scale
Bridge	Insert Point Spherize
Crease	Insert Polyloops Spin
Delete	Inset Spin Edges
Do Nothing	Mask Split
Equalize	Mesh To Brush Transpose
Extrude	Move Unweld
Flip Faces	Polygroup ZModeler Modifiers

TARGET	
A Single Poly	Facing Front All
All Polygons	Facing Front Island
All Quads	Flat & Polygroup
All Triangles	Flat Border
Behind	Flat Inner
Behind & Polygroup	Flat Island
Brush Radius	Infront
Curved Island	Infront & Polygroup

21 USING ZMODELER

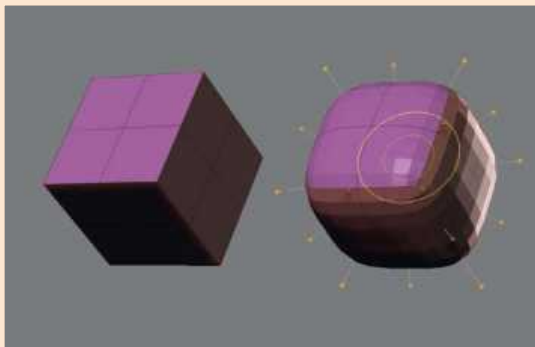
From the Brush menu select the ZModeler brush. ZModeler will now give you access to a new right click menu. Press [Ctrl]+[F] to enter polyframe mode and hover the cursor over the cube. Faces and edges will light up as you mouse over them. The ZModeler menu is contextual so menu options found while hovering over an edge will be edge related, while face editing commands are only seen when over faces. Make sure X Symmetry is on and right-click.

Align Tenth Step	Align Quarter Step	Align Third Step
Align Half Step	Align Full Step	No Alignment
MODIFIERS		
One Side Poly	Multi Sides By Brush	Step Size 0.1
Normal Attraction	Weak Attraction	No Attraction
Disable Triangle Snap	Enable Triangle Snap	
Disable extended Snap	Enable extended Snap	



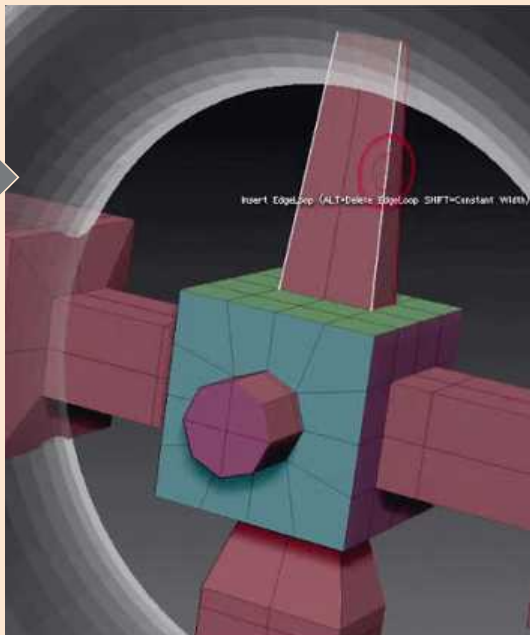
22 EXTRUDE POLYGROUP

You will have a menu with three panels. The top panel defines the action, the second defines the target to apply it to (Single Face, Polygroup All, and so forth) and the third section is for specific modifiers. Select QMesh from the top panel and Polygroup Island from the target panel, from the modifiers panel select Inset Region. Click-drag on one of the cube faces. You will see the entire polygroup extrude as you drag.



23 INSET FACES

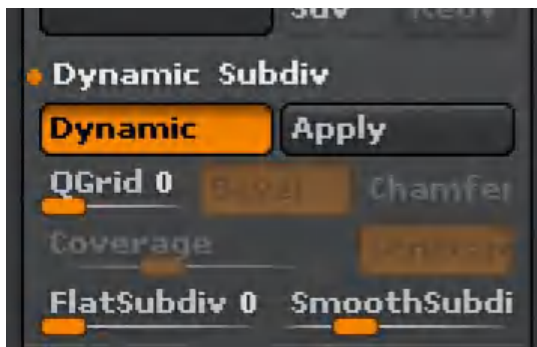
To inset faces select Inset from the first menu and maintain the Polygroup All selection from the second menu. To create a new set of polygroups click on a polygroup from the first menu and make A Single Poly your Target and under Modifiers select Overwrite. Now each face you click will be added to a new polygroup. This will help organise the mesh to work on specific groupings of faces.



To inset faces select Inset from the first menu and maintain the Polygroup All selection from the second menu

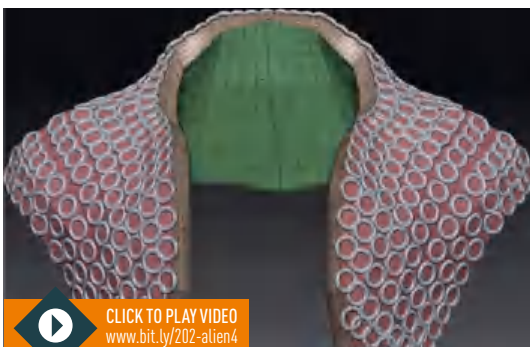
USING POLYGROUPS

You can make a temporary polygroup by holding down [Alt] and left-clicking on faces



24 DYNAMIC SUBDIVISION

Press [D] hotkey to engage the Dynamic Subdivision model new to ZBrush 4R7, allowing you to preview your smoothed model without adding subdivisions. This is important when using tools like meshInsert, which requires the mesh to only have 1 SubD level. ZModeler allows you to execute polygon modelling techniques while inside ZBrush. You can extrude, inset, delete, and scale faces, as well as manipulate edges. The brush based nature of the tool makes it fast and efficient.

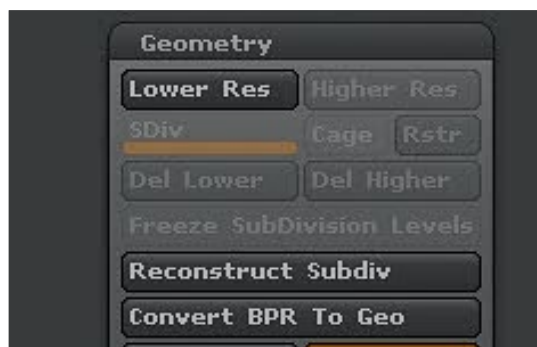


NANOMESH TRICK

Place the linkages just beneath the rings so it looks like a lower layer

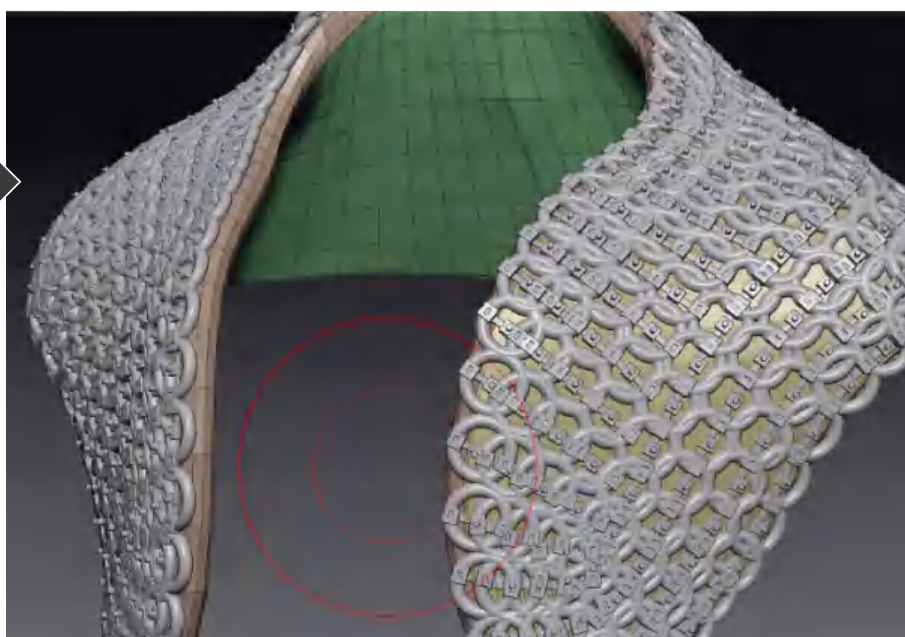
25 USING NANOMESH

Create an Insert MultiMesh brush. We have two subtools; the ring and ZModeler created unit. Click Brush>Create Insert Multi Mesh>Create NanoMesh Brush. With mantle model selected, use the ZModeler brush, set Action to Insert NanoMesh and Target to Polygroup All. Press [M] to select mesh. Start with the ring. Click-drag to draw an instance on each face. Press the Prop button (Tool>Nanomesh menu) to distribute the model proportionally. Press Freeze Placement.



26 MECHANICAL LINKAGE

Press [M] to select the next mesh then click-drag on a face. The rings remain but the mechanical linkage is drawn with it. Use the sliders: Tool>NanoMesh to adjust size and Z offset. Once happy with your NanoMeshes go to Tool>Geometry>Convert BPR to Geometry to turn them into an actual mesh. Hide the original mantle geometry and delete: Tool>Geometry>Modify Topolgy>Delete Hidden so only the chainmail remains. ■





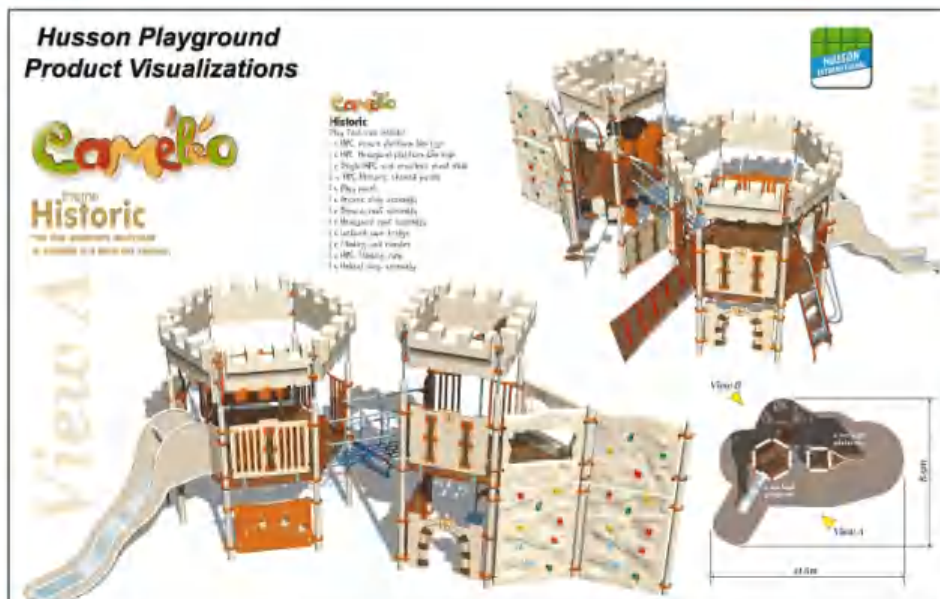
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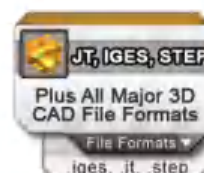
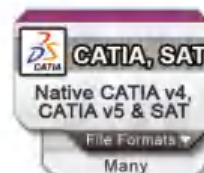
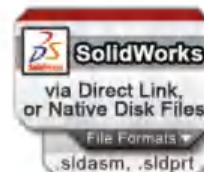
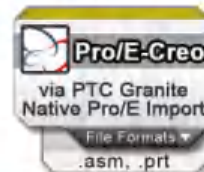
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Husson (UK) is a leading European manufacturer of play and sports equipment. Husson's product visualization director used Okino's PolyTrans|CAD to process and optimize native Pro/Engineer datasets of the children playground equipment into AutoCAD for final rendering. Final layouts were assembled in Corel.



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The CG Awards are decided by top judges from a shortlist nominated by the public. They represent the very best products, technologies and CG content created between May 2014 and May 2015. Visit thecgawards.com for more details



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SPECIAL AWARD

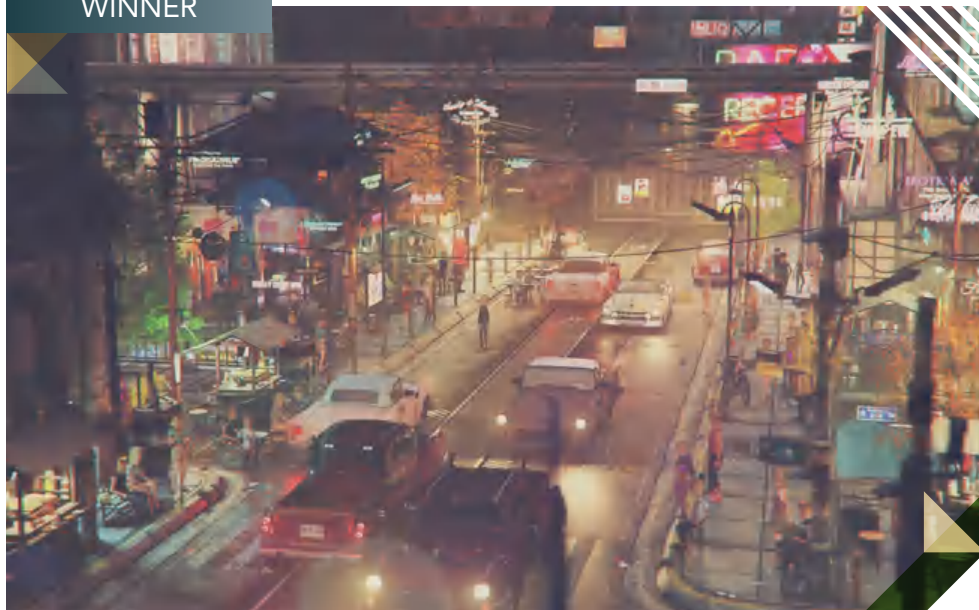
100 3D WORLD HALL OF FAME

COMMUNITY AWARD

101 LIVE EVENT



WINNER



REDSHIFT

Meeting high standards in performance, stability and flexibility

COMPANY: Redshift **WEB:** www.redshift3d.com
MORE INFORMATION: www.redshift3d.com/gallery

Redshift was developed from the ground up to be a production-ready renderer. "Redshift was the first commercially-available product to offer out-of-core textures and geometry, and the first to offer both biased and unbiased GPU-accelerated GI algorithms. Key to this was developing a sound technological foundation that allowed us to implement features thoroughly," says Panos Zompolas, chief technical officer at Redshift.

However, the biggest challenge has been overcoming the perception in the industry that GPU rendering is gimmicky, low-quality or reserved for previz. "That challenge hasn't gone away entirely, but Redshift has proven that it can be a viable alternative to the leading CPU-based production renderers," Panos continues. "We realised early on that a feature is only useful to a user if it meets their workflow needs. So Redshift was



For many of our customers, Redshift is a game changer. Redshift's industry-leading performance translates into huge cost savings for our customers. This in turn means they can bid on larger projects, or projects otherwise out of reach

Panos Zompolas, CTO, Redshift.

designed not just to be incredibly fast, but to make that performance usable by professionals, because of this we see Redshift primarily competing with the industry's top CPU renderers, which follow a similar approach."

RUNNER-UP

AUTODESK MEMENTO

COMPANY: Autodesk
WEB: www.autodesk.com
MORE INFORMATION: www.bit.ly/cg-memento

Want to convert photos or scans of real-world objects or people into 3D meshes? Well now you can with Autodesk's Memento (beta). Memento enables you to streamline tedious workflows to create high-definition 3D models that can be cleaned and optimised for the web, mobile or 3D printing. As CG Awards judge Cirstyn Bech-Yagher says: "I don't think it will be long before tools like this will be part of mainstream kits."

RUNNER-UP

NUKE STUDIO

COMPANY: The Foundry
WEB: www.thefoundry.co.uk
MORE INFORMATION: www.bit.ly/cg-nuke

The Foundry has taken Nuke compositing to a whole new level to create an end-to-end collaborative workflow that can be used to make production even more efficient. "Our goal was to create a solution that was simultaneously all in one and collaborative at the same time. We knew the real power of Nuke was in its collaborative approach and wanted to find a way to bring more power to our existing customer base," says Sean Brice, Nuke product manager.

RUNNER-UP

HOUDINI INDIE

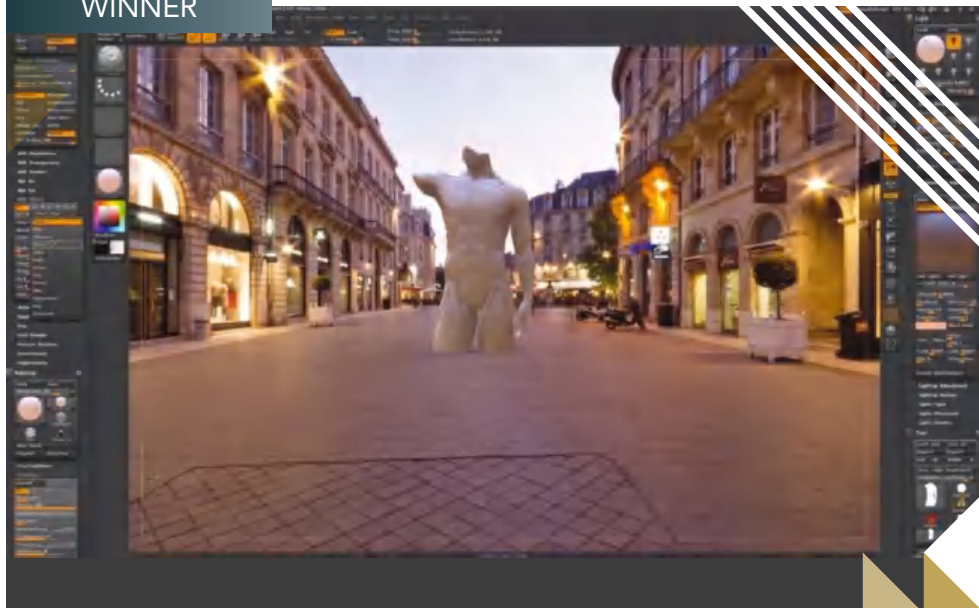
COMPANY: Side Effects Software
WEB: www.sidefx.com
MORE INFORMATION: www.bit.ly/cg-houdini-indie

Side Effects has worked hard to improve the user experience of Houdini. "With an increasing emphasis on making the workflow simpler and cheaper for new users, the power of Houdini is becoming available to all," says CG Awards judge Mike Griggs. Houdini Indie has virtually all the features of its commercial version, meaning it "gives artists access to the Houdini Engine, which lets them open Houdini digital assets into other applications," says Robert Magee, product marketing manager.



Technology SOFTWARE UPDATE

WINNER



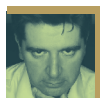
ZBRUSH 4R7

A radical update that added game-changing tools

COMPANY: Pixologic **WEB:** www.pixologic.com
MORE INFORMATION: www.bit.ly/cg-zbrushr47

With ZBrush 4R7 Pixologic introduced innovative tools, like the new dynamic subdivision mode, the bridge to KeyShot and ZModeler. It's tools like these that have really impressed: "ZModeler has been a game changer for a lot of artists because it enables them to focus on a model's shape rather than accuracy of its topology," says Thomas Roussel, marketing director and 3D specialist at Pixologic.

These features impressed judge Ken McCuen, matte painter and concept artist on feature films: "As a traditionally trained artist I have a high respect for developers who make the transition from painting/sculpting in real life to the digital medium easier. I've found ZBrush to be excellent at providing tools to quickly create maquettes as a basis for my work."



The big changes for many artists were the under-the-hood enhancements, like being able to export .fbx files and the 64-bit edition, which proved challenging to Pixologic. "The jump to

ZBrush 4R7 represents one of the largest updates in the time since ZBrush 4 was first released. We wanted to truly innovate: 4R7 brings new features focused on helping artists create artwork that would have been difficult or even impossible before

Thomas Roussel marketing director and 3D specialist, Pixologic

64-bit computing couldn't simply be patched into ZBrush," says Thomas. "It required a major code overhaul from the ground up. ZBrush is highly optimised; built for speed. We took great care so that by going to this new architecture we would be able to have our code be even more optimised."

RUNNER-UP

MODO 801

COMPANY: The Foundry
WEB: www.thefoundry.co.uk
MORE INFORMATION: www.bit.ly/cg-modo801

The Foundry's Modo 801 added node-based shading, improved animation and dynamics tools, and new features across the board. According to Modo's product marketing manager, Shane Griffith, there's a simple recipe the team follows: "There is never a shortage of ideas or feature requests. The trick is to implement them as generally and as robustly as possible so users can add their innovation and creativity to leverage those tools in ways we never could have imagined."

RUNNER-UP

3DS MAX 2016

COMPANY: Autodesk
WEB: www.autodesk.com
MORE INFORMATION: www.bit.ly/cg-3dsmax-review

Autodesk packed 3ds Max 2016 with new features, such as the Max Creation Graph, a node-based scripting environment enabling artists to create custom-scripted tools, without writing a single line of code. These tools can be packaged and shared with other artists, enabling you to collaborate and work at speed. As well as cloud-based rendering and new templates, it was the MCG tool that drew readers to nominate: "Max Creation Graph is a huge innovation for 3D artists," says Goulahs Mesa.

RUNNER-UP

VUE XSTREAM 2015

COMPANY: e-on software
WEB: www.e-onsoftware.com
MORE INFORMATION: www.bit.ly/cg-vue-features

With Vue xStream 2015 e-on software delivered expansions on old tools and new features to expand the reach of its solution for creating rich, realistic nature environments. Fully immersed within 3ds Max, Maya, LightWave and Cinema 4D it's "powerful software at prices hobbyists can afford," says 3D World reader Patrick Robinson. Reader Julien Desreumaux Julot agrees, highlighting the NPR render engine and adding, "the customisable interface is also a strong improvement, and the faster render scene preview."



Technology
PLUG-IN

WINNER



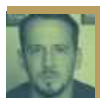
GOLAEM CROWD 4

Focusing on a democratic approach to crowd simulation

COMPANY: Golaem **WEB:** www.golaem.com
MORE INFORMATION: www.vimeo.com/123114700

With Golaem Crowd 4, the team wanted to make it more user-friendly and more open than previous versions. "We implemented tons of helpers, lessened the number of files to manipulate, enhanced all interfaces, and created new ways of accessing Golaem Crowd's internal data," says Golaem Crowd product manager, Nicolas Chaverou. "But as we can't help playing with technologies, we also integrated Nvidia PhysX for doing physics simulation with crowds. It is a huge step forward in terms of speed and quality, and it also enables new features like servo force (mixing animation and physics simulation together) or direct physical interaction of the crowds with Maya objects."

The focus on making the plug-in more user-friendly hasn't gone unnoticed by artists like Jose Martin, 3D lead at Psyop and CG Awards judge: "Golaem Crowd 4 brings complex crowd simulations to Maya while keeping things simple to



We have Golaem Crowd fully integrated into our pipeline making complex crowd choreography possible for both TV and feature film projects. We've been working with Golaem since version 2, and version 4 is a vast improvement!

Nicolas Hernandez, head of 3D and VFX supervisor, Milk

the artist. This fourth release features cloth simulation and a better visual performance, and supports the latest render engines among other improvements. And all this without leaving our Maya scenes – something crucial to the workflow."

RUNNER-UP



X-PARTICLES 3

COMPANY: Insydium
WEB: www.x-particles.com
MORE INFORMATION:
www.vimeo.com/121234858

X-Particles is a full-featured particle and VFX system for Cinema 4D. It impresses with its unique system of using questions and actions, meaning users have full control over particle simulations without the need for Xpresso or Cinema 4D's native particle system. As Simon Russell, a London-based animation director says, "I use X-Particles a lot in production, there are so many things it does better than the old system we used; like caching, the fact that it's multi-threaded, it's fast, flexible and easy to experiment with, so you can develop ideas and move stuff around. And it's powerful as well, so it's good for rendering a huge amount of particles."

RUNNER-UP



ARNOLD FOR CINEMA 4D

COMPANY: Solid Angle
WEB: www.solidangle.com
MORE INFORMATION:
www.bit.ly/cg-arnold-c4d

Originally developed for – and with – Sony Pictures Imageworks, Solid Angle's Monte Carlo-based render engine is a leading renderer in film production and the standard renderer for leading studios and production houses. Its plug-in for Cinema 4D proved essential. The C4DtoA team says, "In developing our IPR tool we were able to build a flexible framework which quickly and smoothly reacts to user input and scene changes, allowing artists to harness Arnold's power, exploring and iterating quickly. The approach we took with our Arnold shader network editor was also technically difficult from a development perspective, but allowed us to build a mature and robust tool."



Technology SOFTWARE INNOVATION

WINNER



UNREAL ENGINE 4

Photorealistic renders in real-time

COMPANY: Epic Games **WEB:** www.epicgames.com
MORE INFORMATION: www.unrealengine.com

Unreal Engine 4 is a complete suite of game development tools, but its success has been in attracting new users to those real-time tools, including filmmakers and animators.

"Epic Games made a big, bold move back in March this year that demonstrates it has its eyes looking five, 10 and 20 years ahead, by making UE4 a free platform for the likes of us [arch-viz artists] to tap into its platform and use it to tell our client's story in new and captivating ways," says CG Awards judge Ronen Bekerman.

As Epic Games' Tim Sweeney explains, "Unreal Engine has evolved from low-res software rendering in 1995 to high-end 4K, VR and AR use today." Its new workflow features and deep toolset enable developers to quickly iterate on ideas with quick results.

"UE4 is a giant leap forward in usability, improving across the board and building upon what was already

an amazing product," says Davide Bianca, CG Awards judge and creative director of Saizen Media, before adding: "The way the engine handles complex lighting, particle systems and VFX, makes it a valid, fast alternative to the pre-rendered approach."



Unreal 4 wasn't just a major leap in technology over U3, it also introduced powerful, intuitive and elegant ways of working with 3D worlds. Then Epic made it available to everyone, empowering a new generation of game designers

Ash Joseph, lead designer, The Foundry

RUNNER-UP



LUMENRT 2015

COMPANY: e-on software
WEB: www.e-onsoftware.com
MORE INFORMATION: www.lumenrt.com

In recent years, e-on software has pioneered the concept of Immersive GeoDesign. LumenRT provides an interactive 3D medium to create and explore GeoDesign projects. LumenRT is a complete system for transforming 3D models and designs into rich, nature-filled videos, images and real-time immersive media, so that ideas can be seen and communicated with clarity. "Our mission is to help architects, designers, engineers and GIS professionals convey their vision in an engaging manner – to help them tell a better story by allowing the audience to experience their designs," said an e-on software spokesperson.

RUNNER-UP



HYPERION

COMPANY: Walt Disney Animation Studios
WEB: www.disney.com
MORE INFORMATION: www.bit.ly/cg-hyperion

Disney's Big Hero 6 was so complex and ambitious, the studio needed to find a way to make true multi-bounce work with a tremendous amount of geometry. "We had to build the entire city," says CTO Andy Hendrickson. "That level of geometry necessitates the technology of GI. We took a look at the landscape of the GI renders and we decided we needed a new approach." In striving to develop a look never seen before in an animated feature film, Hyperion was born. And we can't wait to see what they do with the production renderer next.



Technology HARDWARE INNOVATION

WINNER



CINTIQ COMPANION 2

A full creative studio in a mobile device

COMPANY: Wacom **WEB:** www.wacom.com
MORE INFORMATION: www.bit.ly/cg-cintiq

Wacom has leveraged 30 years of experience in pen-based tablets, patented technologies and unique manufacturing processes to bring a unique solution to us. "The Cintiq Companion is a fantastic tool that allows you to take your studio anywhere," says Iñaki Gonzalez. "The power CPU means there are no delays or jags while working and with so much RAM memory you can easily work on large files."

"Our ambition is to produce innovative and inspirational products that enhance the creative workflow," says Jeff Mandell, executive vice president branded business, Wacom. "Here we were able to develop a state-of-the-art Cintiq graphic display and integrate it into a stand-alone mobile computing device for on-the-go creativity. We had to find a way to squeeze powerful drawing capabilities into a sleek design that minimised size and weight. We wanted to keep the features artists love, such as superior pen performance,



I'm very impressed with the screen quality and the fidelity of the colours, and with the overall build quality of the kit and the tablet's ergonomics. Wacom has learned from the first generation mistakes and improved almost everything

Nicolas Hernandez, VFX supervisor and head of 3D, Milk

the natural pen on paper feel, programmable keys and custom multi-touch gesture support. Most importantly artists can run full versions of key applications for creativity, so they do not need to learn new software, or compromise by using light creative apps."

RUNNER-UP



GEFORCE GTX TITAN X

COMPANY: Nvidia
WEB: www.nvidia.co.uk
MORE INFORMATION: www.geforce.co.uk

GeForce GTX Titan X is a monster of innovation. It combines the latest technologies and performance of the new Nvidia Maxwell architecture to be 'one of the fastest, most advanced graphics cards available today.' Over the past few years, lots of software programs have started taking advantage of the GPU on your workstation, and with the Titan X GPU boasting over 3,000 CUDA cores and around eight billion transistors, it's easy to see why people are impressed. The real number that has caught artists' attention is the massive 12GB frame buffer. It's little wonder this monster GPU is becoming a favourite for 3D artists with large-scale projects.

RUNNER-UP



CELSIUS C740

COMPANY: Fujitsu
WEB: www.fujitsu.com
MORE INFORMATION: www.bit.ly/cg-celsius

With the Celsius C740 – a 1U rack-mounted graphics workstation – Fujitsu has created a virtual workstation to service large manufacturing firms. Fujitsu's engineers maximised rack density in the data center while at the same time offering true workstation performance in only 1U. This enables artists in the automotive, aeronautic, energy and the healthcare industry to benefit from faster time-to-market and reduced innovation cycles from the safety of the data centre. It's extremely expandable, and efficient, offering users a powerful workstation wherever they are, from any device.

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Creative

CG ANIMATED FEATURE FILM

WINNER



BIG HERO 6

A visually stunning animation that tackles big themes with humour

COMPANY: Disney **WEB:** www.disney.co.uk
MORE INFORMATION: www.bit.ly/cg-bighero6

Big Hero 6 is a story told in the finest traditions of Disney. Its message is reaffirming and heartfelt, and visually, it's a stunning blend of new technology and well-honed skill.

According to producer Ron Conli, Disney strove to develop a look never seen before in an animated feature film: "We created a new rendering system called Hyperion to produce the incredible world of San Fransokyo. We developed a character-building program called Denizen to populate the streets... Our Effects Department created the 'microbots' and the 'interior of the portal'. Artists and technical teams worked hand in hand to support our story."

It's a view shared by CG Awards judge Shelley Page, who says: "This classic surrogate-big-brother relationship story is elevated by old-fashioned physical comedy that is superbly timed and hilariously funny. The pared-down design of the main character reveals the brilliance of the animators who create a lovable, touching and

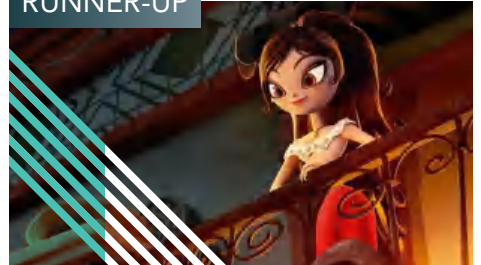


It is a real honour to not only be nominated for this award, but to have won. This project has touched the hearts of audiences around the world... I am so privileged to work with such a talented team of artists

Ron Conli, producer, Big Hero 6

unforgettable hero from the simplest of elements. Blending the best of classical animation with the latest digital techniques, this is the most visually ambitious CG animated film Disney has produced to date."

RUNNER-UP

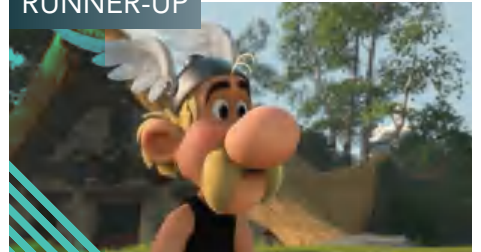


THE BOOK OF LIFE

COMPANY: Reel FX & Fox Animation
WEB: www.reelfx.com
MORE INFORMATION: www.bit.ly/cg-bookoflife

This Guillermo del Toro produced CG movie explores love and redemption while borrowing its visual style from Mexico's Day of the Dead festival. Directed by Jorge R. Gutiérrez, The Book of Life mixes three fantastical worlds into its narrative and looks like no other CG movie released in recent years. Earning a slew of award nominations, including a Golden Globe, more people deserve to see this colourful ode to life's missed chances and grand love. "There hasn't been a CG movie yet, that looks like this film," says 3D World reader Ryan Prestidge. "It stands alone and it's amazing!"

RUNNER-UP



ASTERIX: THE LAND OF THE GODS

COMPANY: Mikros Image
WEB: www.mikrosimage.eu
MORE INFORMATION: www.bit.ly/cg-asterix

More widely known for its VFX and post-production work, Mikros Image made the move into CG animated feature films with this funny animation. The French studio was tasked with overseeing the overall production over the course of two years, which included the supervision of the work by two studios in Belgium: it was a huge undertaking. The characters are adorable and the story remains true to the spirit of the original books, but what impresses are the visuals – Mikros Image has done a great job.



Creative

CG ANIMATION SHORT

WINNER



LE GOUFFRE

A unique-looking short with a great back story

COMPANY: Lightning Boy Studio **WEB:** www.legouffre.com

MORE INFORMATION: www.vimeo.com/118471437

The goal of creators Carl Beauchemin, Thomas Chrétien and David Forest was to make a film that they loved and would catch the attention of industry professionals. And Shelley Page, CG Awards judge and head of international outreach at DreamWorks Animation believes that it has done just that: "The story of the making of this visually exciting and emotionally uplifting film is almost as inspiring as the subject! Made by a group of graduates in Montreal and supported by crowdfunding, this story of the heroic attempt of two backpackers to build a bridge spanning an impossibly wide chasm is as compelling as it is impressive. The main characters never speak, but we are irresistibly swept along by their determination."



The team spent over six months experimenting with different versions of the world, some filled with fantastical creatures, before coming up with the final version. "Making

How we made our short is similar to the short's story itself. We used our creativity to adapt and compensate for our lack of funds. There were difficult moments, things that we didn't anticipate, and we ended up needing the help of others along the way

Thomas Chrétien, co-director, Le Gouffre

a 10 minute film with only three CG artists was a huge challenge," says Thomas. "It took us two years. We had to come up with a style that would render fast enough so that we could generate the film's frames with only three computers."

RUNNER-UP



WRAPPED

ARTISTS: Roman Kälin, Falko Paepfer and Florian Wittmann

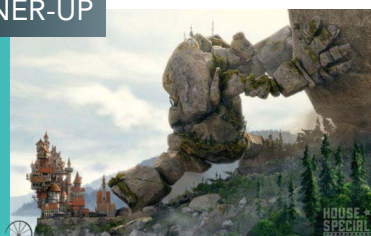
WEB: www.wrappedshort.com

MORE INFORMATION: www.bit.ly/cg-wrapped

This student short by Roman Kälin, Falko Paepfer and Florian Wittmann from the Institute of Animation, Effects and Digital Postproduction at Filmakademie Baden-Württemberg won several awards in 2015.

Wrapped focuses on the idea that the only constant is change, using techniques such as time-lapse, live action and stunning CG. "We created our own small tools and combined time-lapse photography with 3D, which was totally new for us," says Roman Kälin. "We could use our tools in a customised way, which helped us tell the story we wanted to tell."

RUNNER-UP



TALE OF MOMENTUM & INERTIA

COMPANY: HouseSpecial

WEB: www.housespecial.com

MORE INFORMATION: www.vimeo.com/105788896

It's testament to the great writing and animation that we feel an affinity with the rock monster in HouseSpecial's 70-second animation. "Our Rock Giant is an emotional being and viewers relate to him and his basic moral dilemma all humans face individually and as a community," says co-creator and director Kameron Gates. "Everything needed to feel tactile – not typical in CG. In fact, the original model of the Rock Giant was made out of actual rocks." In the end the short used Maya for modelling, texturing, animation and lighting.



Creative

VFX FEATURE FILM (SCENE)

WINNER



© Warner Bros. Entertainment Inc. and Paramount Pictures Corporation

INTERSTELLAR (SPACE SCENES)

Fuses old-school optical effects with state-of-the-art CG research

COMPANY: Double Negative **WEB:** www.dneg.com/dneg_vfx/interstellar-2

MORE INFORMATION: www.bit.ly/cg-interstellar-blackhole

Double Negative's work on Interstellar mixes miniatures, opticals and in-camera projection FX with CG research such as the cutting-edge relativistic renderer developed to reveal the way a black hole warps the fabric of space time.

"On one hand we wanted to be absolutely faithful to the reality of space exploration, staying as true as possible to the incredible material captured by space explorers over the last six decades," says VFX supervisor Paul Franklin. "On the other we were passionate about revealing some of the universe's most astonishing phenomena; the reality of the cosmos is so much stranger than fiction."

"I liked the realism, and the mix of models and CG. I have visited NASA and the VFX produced for this film felt real," says AMD's Robert Jamieson. It's a view shared by fellow judge, Jim Thacker, who says: "CG has rarely blended art and science as spectacularly as Double Negative's



Winning the VFX Feature Film award in the 3D World CG Awards is a wonderful honour. 3D World has been such an integral part of the CG and VFX community for such a long time it's a real validation of all the hard work that the team put in on the movie

Paul Franklin, VFX supervisor, Interstellar

wormhole sequence for Interstellar: recipient of both an Academy Award and a paper in the American Journal of Physics. The plot is pure 2001, but the effects are closer in spirit to NASA's landmark Voyager fly-by animations."

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RUNNER-UP



AVENGERS: AGE OF ULTRON (HULK VS HULKBUSTER)

COMPANY: Industrial Light & Magic

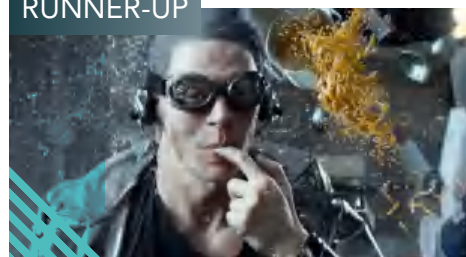
WEB: www.ilm.com

MORE INFORMATION:

www.bit.ly/cg-avengers

The Age of Ultron had some pretty spectacular VFX, but what caught the audience's eye was the fight between the Hulk and Stark in his Hulkbuster suit. The fight is very well executed, with both characters receiving some major blows and extra mechanical bits of armour flying in to replace bits that Hulk has ripped off Stark's suit, before the Hulkbuster employs the automatic punching arm that repeatedly hammers the Hulk into the ground. According to VFX supervisor, Ben Snow, "the robotic arm was an afterthought" – we're grateful they had a little time to play.

RUNNER-UP



X-MEN DAYS OF FUTURE PAST (QUICKSILVER SCENE)

COMPANY: Rising Sun Pictures

WEB: rsp.com.au

MORE INFORMATION:

www.bit.ly/cg-x-men

X-Men: Days of Future Past is a spectacular film, but there's one shot that's truly exhilarating: Quicksilver runs at lightning speed around the Pentagon kitchen plucking bullets out of the air, makes the guards punch themselves and even tastes some food. "This work is grounded in realism," says VFX supervisor Tim Crosbie. "Even though it's a fantastical event you still want to feel as though you're there. The biggest challenge is to find that balance between an exciting, magical event and one that looks real."



Creative VFX FILM SHORT

WINNER



POWER/RANGERS

A labour of love and dedication

DIRECTOR: Joseph Kahn **WEB:** www.josephkahn.com, www.ingenuitystudios.com
MORE INFORMATION: www.vimeo.com/120835426

Ingenuity Studios worked with director Joseph Kahn to create this 'bootleg' short film. The sheer number of shots combined with the complexity of the VFX work is extraordinary. The team spent many late nights and weekends over the course of six months to create this film, and are pleased their efforts haven't gone unnoticed: "We were quite busy with other projects during post-production on Power/Rangers which meant splitting time and a lot of late nights," says VFX supervisor Grant Miller.

"When doing work on a personal project like this, you really operate in a box," says fellow VFX supervisor David Lebensfeld. "You have no idea if a single other soul will see it, or care. You get lost in the work, the fun of it, the stress of it; the challenges with little to no expectation of external reward. The response has been nothing short of gratifying and frankly, shocking. This award is the cherry on top."



2015 was a great year for short films; the level of competition makes winning this award particularly sweet. Additionally, it's always nice to be honoured by a group of your peers

Grant Miller, VFX supervisor, Ingenuity Studios

The team borrowed fellow artists from other projects who had some downtime. This practice benefitted the film, as each of the 248 VFX shots were worked on by numerous artists throughout the studio, which helped to craft a cohesive, varied and engrossing film.



RUNNER-UP



ARTTOO IN LOVE

DIRECTOR: Evan Atherton
WEB: www.arttooinlove.com
MORE INFORMATION: www.facebook.com/ArttooinLove

This brilliantly executed short, directed by Evan Atherton, is the result of a love for Star Wars, technology and filmmaking. Evan created Arttoo in Love with the help of some friends at Autodesk, where he was an intern: it shows everyone's favourite droid falling in love with a letterbox. It's well written and beautifully shot, with R2-D2 bringing his loved one a picnic and defending her from humans when they try to post letters. It was a winner in the eyes of our CG Awards judge Cirstyn Bech-Yager: "How can you not love Arttoo in Love? It has everything: beautiful craftsmanship from textures to final output and a sweet little story with a happy ending."

RUNNER-UP



SYNC

DIRECTOR: Hasraf 'Haz' Dulull
WEB: www.hazvfx.com
MORE INFORMATION: www.vimeo.com/110149838

SYNC is one of two proof of concept films that Hasraf wrote, produced and directed. The short film feels epic, but was made on a budget: "You have to think outside the box when using CGI, VFX, design and live-action combined to tell a grounded story about an everyday threat – cyberterrorism," says director Hasraf. "Sync has opened doors for me as a filmmaker, leading to my debut feature currently in production. I'm especially proud this film has enabled the talented VFX team who worked with me on this film to go onto bigger things."



Creative

CG COMMERCIAL CAMPAIGN

WINNER



SSE MAYA

An emotive, fully CG character marks out this exceptional spot

COMPANY: The Mill **WEB:** www.themill.com
MORE INFORMATION: www.vimeo.com/118901237

The Mill took seven months to create a ground-breaking piece of work to showcase the actions of leading renewable energy company SSE. The team collaborated with adam&eveDDB and academy director Frederic Planchon to create the 90-second spot that depicts an entirely CG orangutan climbing up buildings and experiencing all that a big city has to offer, before going back to the forest to nurture its baby.

The dedication of the VFX team's work shines through. The Mill's Dan Moore said: "We looked through hours and hours of footage of orangutan to try and work out how they move, how they gesticulate and how they emote."

The team used reference from primate impersonators to create the photorealistic CG ape, which enabled the animators to capture the very essence of the creature. An extraordinary amount of work went into the character, from building an anatomically correct skeleton and developing

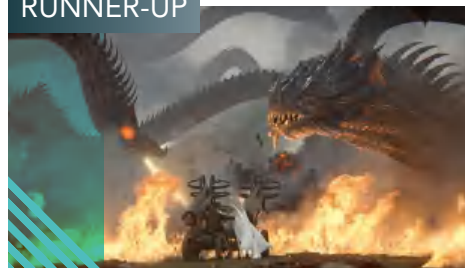


The photorealistic CGI orangutan created for SSE Maya looks absolutely real. The expressions in the ape's eyes and the way it emotes are highly expressive yet subtle enough to appear convincingly real

Oliver Conrad, freelance director and co-founder of Kompost

a fully functional muscle system, to working on the simulation of the hair so that it would respond to gravity and wind. Each wrinkle was sculpted by hand, before compositing the orangutan onto live-action plates.

RUNNER-UP

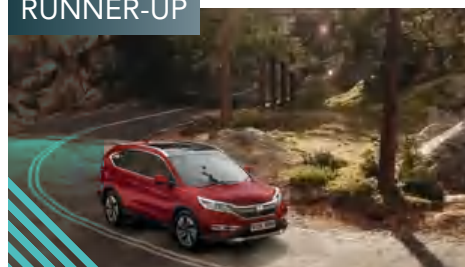


GAME OF WAR: FIRE AGE

COMPANY: Method Studios
WEB: www.methodstudios.com
MORE INFORMATION: www.bit.ly/cg-gameofwar

This spot for Machine Zone's Game of War: Fire Age video game for iOS and Android, is a live-action interpretation of the game that includes a photo-real, fire-breathing hydra, a digital army, dazzling simulated effects and matte-painted environments. "One of the biggest challenges was the schedule for completing such a large amount of VFX – a nail-biting 11 days from final edit to delivery," noted VFX supervisor Benjamin Walsh. The tight turnaround didn't impede the quality of the visuals: "I'm particularly blown away by this piece as to what they were able to achieve in quality and production value, really delivering something that felt grandiose, sexy and appealing," says Allan McKay, Hollywood VFX and TD.

RUNNER-UP



HONDA ENDLESS ROAD

COMPANY: Glassworks
WEB: www.glassworks.co.uk
MORE INFORMATION: www.bit.ly/cg-endless-road

Like all great VFX, this smooth-looking spot belies the hard work that has gone into making it. Directed by Gorgeous's Chris Palmer for McGarry Bowen, the film shows a Honda CR-V driving on an 'endless road' – it is truly hypnotic and slightly dizzying. It was created using a three-dimensional Droste Effect (whereby a picture appears within itself, and so on), which meant that the Endless Road could go on forever and ever.



Technology

3D PRINT INNOVATION

WINNER



CLIP TECHNOLOGY

A radically new direction for additive manufacturing

COMPANY: Carbon3D **WEB:** www.carbon3d.com
MORE INFORMATION: www.bit.ly/cg-clip-tech

Carbon3D made its debut at TED 2015 and took the 3D printing industry by storm, demonstrating speeds 25 to a hundred times faster than traditional 3D printing. In his TED talk Joseph DeSimone CEO and co-founder said, "We were inspired by the Terminator 2 scene with the T-1000, and we thought, 'Why couldn't the 3D printer operate in this fashion, where you have an object arise out of a puddle, in essentially real time, with essentially no waste, to make a great object?'" The Carbon3D team met the challenge, and Continuous Liquid Interface Production, or rather, CLIP technology was born.

The standard layer-by-layer additive process is inherently slow because of the need to stop, reset and repeat, but CLIP is a chemical process that carefully balances light and oxygen to eliminate the mechanical steps and the layers.

It works by projecting light through an oxygen-permeable

window into a reservoir of UV curable resin. The build platform lifts continuously as the object is grown.

CLIP moves beyond the limitations of 3D printing to offer unprecedented quality and choice – all at game-changing speed.

Carbon3D's CLIP technology controls the photo-polymerisation process, allowing for continuous growth, building objects that are smoother, stronger and exponentially faster! This innovation has huge implications for widespread adoption of 3D printing

Aiman Akhtar, freelance 3D artist

RUNNER-UP



EMBER 3D PRINTER

COMPANY: Autodesk
WEB: www.ember.autodesk.com
MORE INFORMATION: www.vimeo.com/139423899

With this new hardware desktop stereolithography 3D printer, Autodesk has turned its hand to making hardware products. The Ember 3D printer has been designed for reliability, speed and high-resolution to give you precision in your prints. Every detail, from the size of the build head to the angle of the control panel, has been designed for ease of use. The printer is precise, sleek and open-source. "I love where 3D printing is going and this is one of the shiniest examples yet," says CG Awards judge Cirstyn Bech-Yagher.

RUNNER-UP



HOBBS STUDIO

COMPANY: Hobbs Studio
WEB: www.hobsstudio.com
MORE INFORMATION: www.bit.ly/cg-hobs-video

London-based Hobbs Studio specialises in the provision and creation of innovative, high-quality 3D solutions for designers, architects and engineers. It's the largest 3D printing bureau in the UK and has an impressive selection of technologies, including full colour 3D printing, stereolithography (SLA) and multi-jet 3D printing for all forms of rapid prototyping.

The company uniquely combines traditional architectural model making with 3D printing to produce highly finished architectural or product design models. "I feel this company has made great advances in the 3D printing world in the last two years, if you don't believe me then just check out their website," says reader Jeremy Justic.

WINNER



KING EDWARD HOTEL

Beautifully merging the past, present and future

COMPANY: Zerofractal Viz Studio **WEB:** www.zerofractal-viz.com
MORE INFORMATION: www.bit.ly/cg-kingedward-facebook

This image has a beautiful visual narrative that really pushes the boundaries of architectural visualisation. Past, present and future are merged in a frame within a frame. The Canadian studio has been pushing the boundaries of architectural visualisation since 2000. In every single project there is a constant and honest concern about telling the right story, using the appropriate visual narrative.

"With today's technology, it is easier to achieve a hyper realistic look in arch-viz. This doesn't mean that the technique is not important any more, nor that the industry is reaching its end. Just like photography has not ended as a profession with the rise of point shoot cameras with great resolution," explains Zerofractal's Jose Uribe, adding, "It just means that people and professionals are starting to value more what is really important: the message and the story behind each visual." Mauricio Metz, senior 3D

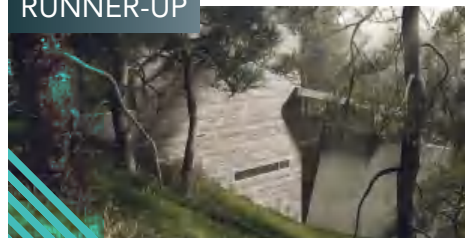


This image incorporated past and future with a nice romantic twist, evoking memories of long past while dealing with the core of our subject matter – architecture. Seeing this image, you can't avoid wanting to dive deep into it exploring every detail of the building

Ronen Bekerman, founder and creative director, Polytown

artist and director of 3D at Zerofractal adds, "our goal was to speak about past, present and future, we also wanted to have the juxtaposition of three different times within one image. This was achieved by combining a photo within a photo."

RUNNER-UP

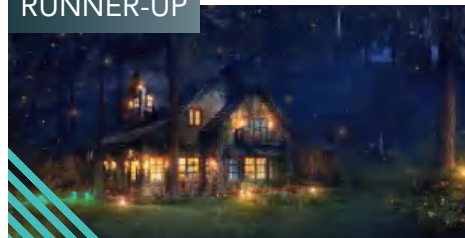


NALIN ON MOUNTAIN

COMPANY: Vic Nguyen Design
WEB: www.bit.ly/cg-nalin
MORE INFORMATION: www.behance.net/vicnguyendesign

Vietnamese artist Vic Nguyen was inspired by Bogdan Tomasevski's "amazing architectural design", to create this rich, deep scene with an unusual composition which places the building within the landscape and trees. The concept is well executed and brought to life with subtle detail and a wonderful eye for the dramatic scene. "It takes serious skill to make something look so real, and so effortless. Beautiful work," says CG Awards judge Cirstyn Bech-Yagher. Vic likes to find unique ways to look at things; he uses Google maps and plays with camera angles "to try to find the most interesting perspective," he says.

RUNNER-UP



THE FIREFLY COTTAGE

COMPANY: Ifthikhar Abdul Nasser
WEB: www.ifthikhar.com
MORE INFORMATION: www.wp.me/pjlxP-2Z

This work impressed us with its lighting and composition. Ifthikhar created this scene to test his techniques and to try out different styles of lighting, texturing, landscaping and post-production. "I once had a dream about millions of fireflies lighting up all around my house; I fancied them to be stars that took life and came down from the skies," says the artist. "Here I tried to recreate the same dream in 3D using 3ds Max, V-Ray and Photoshop. I take inspiration from nature, and was inspired by various journeys through the Himalayas to create this cottage."

WINNER



MUSÉE DU LOUVRE

Beautiful visuals set at a lovely pace

ARTIST: Ryan Groves **WEB:** www.ryangroves3d.com
MORE INFORMATION: www.bit.ly/cg-ryan-groves

Ryan Groves created this three-minute animation to test his skills as a 3D artist – in fact, it's his first attempt at animation. 3ds Max and V-Ray were the core tools used, along with Nuke Studio (non-commercial) for post-production. He employed a variety of modelling and texturing techniques, from poly modelling and splines to V-Ray blends, mix maps and composites.

The result is a beautifully crafted animation that takes you on a journey through the elegant architecture of the Louvre, showcasing several lighting scenarios.

"I paid close attention to what I think drives architectural representation: Mood, lighting, atmosphere, composition and detail. I wanted to create an evocative piece of architectural film that would combine with a piece of music and sound effects to draw the viewer in and hopefully generate an emotive response," explains Ryan. "I hope



I'm over the moon to have won the award, it makes all of the hard work put into the project worthwhile. Learning animation was the whole reason I made the film and it helped me to learn many new techniques

Ryan Groves, 3D artist at The Neighbourhood

when people watched it and voted they saw the passion I have for creating my artwork and appreciated the effort I put in to try and craft a project full of depth and detail, to generate a piece of arch-viz with evocative and emotive qualities."

RUNNER-UP

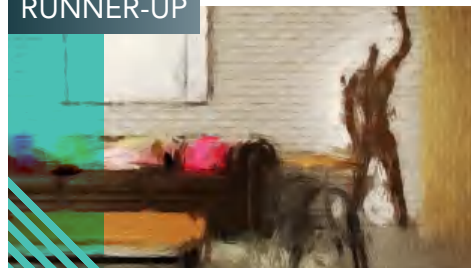


CG NEW TRAIN STATION + LED INSTALLATION, WESTMINSTER, COLORADO

ARTIST: Nicolas Wehncke
WEB: www.bit.ly/cg-led-project
MORE INFORMATION: www.bit.ly/cg-nicolas-wehncke

This hypnotic display of lights was created by Nicolas Wehncke, who runs RVArq. Nicolas says he likes the "serene way how changing colours flowing and glowing over the LED installation, contrast with the architecture of the station." But what made our CG Awards judges choose Nicolas? "I was very impressed with the level of detail, composition and camerawork," reveals Ken McCuen.

RUNNER-UP



PIPA HOUSING

ARTIST: Andrea Martin (for Motiva)
WEB: www.motivacg.com
MORE INFORMATION: www.bit.ly/cg-andreamartin

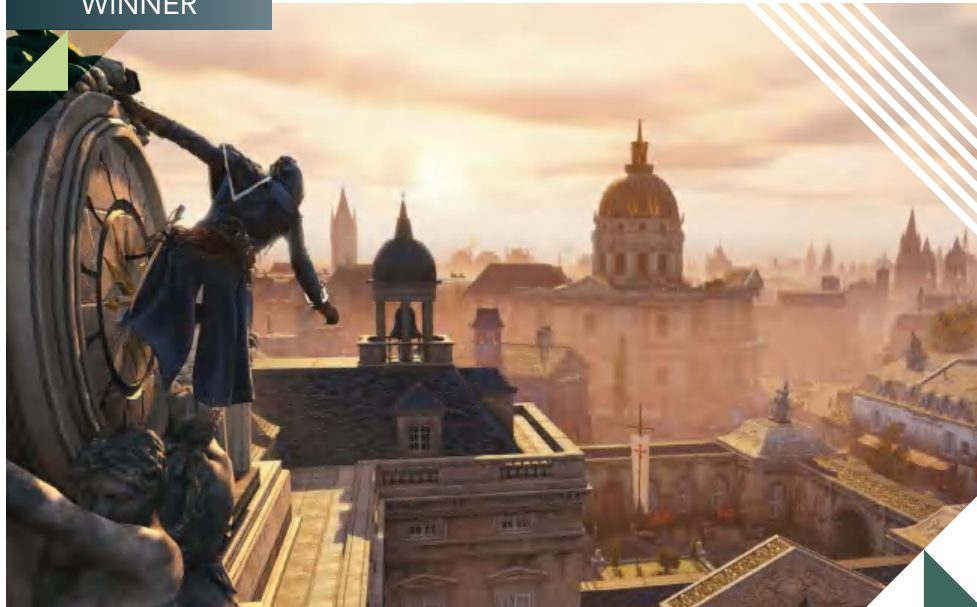
Andrea developed a new tool to transform the various scenes in the film to show a 'moving oil painting' for this experimental arch-viz animation. "Andrea designed a totally new procedural system of living [spaces] based on Le Corbusier's l'Unité d'Habitation that allows you to create any kind of interior space using a few prefab modules," explains Victor M. Feliz, head of R&D, Motiva. It's a great technical innovation that gives the animation a completely different look. "I loved the concept of the houses being built and then the whole style changing when you came indoors," says CG artist and judge Cirstyn Bech-Yagher.



Creative

CG VIDEO GAME IN-GAME

WINNER



ASSASSIN'S CREED: UNITY

A rich open world with endless possibilities

COMPANY: Ubisoft **WEB:** www.ubisoft.com
MORE INFORMATION: www.bit.ly/cg-assassins-creed-unity

This award goes to the title that delivers the very best in terms of art and production design, and Ubisoft continues to up the ante with this latest offering to the Creed series. The art direction is absolutely awe-inspiring. Set in the fictional world of revolutionary France circa 1700s, the game boasts some of the best-looking and most-atmospheric cityscapes we've ever seen. The world Ubisoft has created is filled with charm and character – from the huge crowds of revolutionaries marching in the streets where the sunlight reflects off puddles, to the gorgeous views of the sprawling city from the rooftops. And the cutscenes have been masterfully crafted too. Ubisoft has improved on previous Creed titles, with support for larger landmasses, more objects, bigger



Assassin's Creed: Unity, while still room for improvement, has an explorable environment of remarkable scale and combined with an enormous volume of characters is an admirable feat. This attempt to create a plausible city with such breadth and temporal accuracy is one of the most impressive examples thus far

Mai-Ling Lee, CG supervisor and CG Award judge

buildings and beautifully realised interiors to explore. Depth of field effects have also been improved, along with a host of other enhancements that improve the visual fidelity, such as shadowing and reflection effects, level of detail instancing and object interaction.

RUNNER-UP



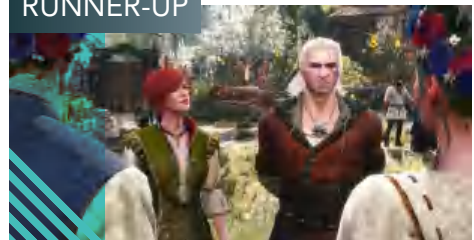
ALIEN: ISOLATION

COMPANY: The Creative Assembly
WEB: www.creative-assembly.com
MORE INFORMATION: www.bit.ly/cg-alien

Alien: Isolation is a first-person horror adventure developed by The Creative Assembly and published by Sega that emulated the franchise's atmosphere: "It recaptured the feel of dread that had been lost with the more recent game adaptations of the Alien franchise," says Mike Griggs, CG artist and Awards judge.

The team built an entirely new engine to accommodate technical aspects such as the game's atmospherics and lighting effects. "By creating a tailored engine alongside the game we were actually able to really maximise the focus of the engine to support the game we were making," said lead designer, Gary Napper.

RUNNER-UP



THE WITCHER 3: WILD HUNT

COMPANY: CD Project Red
WEB: en.cdprojektred.com
MORE INFORMATION: www.bit.ly/cg-witcher3-evo

A monumental amount of beautiful modelling and texturing work has gone into creating this massive open world adventure that never fails to amaze or impress at every turn. "I don't know how many litres of blood, sweat and running expletives it has cost CD Project Red to create this game, but it set a new standard, in so many ways," says CG Awards judge Cirstyn Bech-Yagher. "The sheer amount of detail in everything from the leaf-shaders to things you can find in buildings and on the maps is more than anything I've seen in any other game."



Creative

VIDEO GAME PROMOTION

WINNER



THE DIVISION: TAKE BACK NEW YORK

Impressive time-lapse work sets this emotive piece apart

COMPANY: Blur Studio **WEB:** www.blur.com
MORE INFORMATION: www.bit.ly/cg-the-division

The Division's story is a grand and sweeping one: a whole city dealing with tragedy, but in order to connect with people on an intimate level Blur wanted a microcosm of the larger event, and centres the action on one family dealing with the outbreak to great emotional effect. Darren Butler, CG supervisor explains: "Initially reading the script, I got a bit of a lump in my throat thinking to myself how were we supposed to pull off 14 days of time-lapse in one single shot... but with the help of the whole team and a few new tools, we managed to pull off something that we are all extremely proud of."

The evocative lighting for the time-lapse proved quite challenging for Blur. "Knowing we were going to be covering multiple days of day/night lighting scenarios in a single section that needed to hook up with a moving background, we came to the conclusion that a full 360

spherical HDRI sequence covering multiple/sequential days would be the best," he continues. FX supervisor, Brandon Riza camped out on a mountain capturing 96 straight hours of full range dome HDRIs. Now that's commitment, and it shows.



I watched the gameplay feed on this at last year's E3, and I loved what I saw. The cinematic wets your appetite even more – and makes me a little sad it's not a movie I can watch right now

Cirstyn Bech-Yagher, CG Awards judge and artist

RUNNER-UP



BATMAN: ARKHAM KNIGHT

COMPANY: Blur Studio
WEB: www.blur.com
MORE INFORMATION: www.bit.ly/cg-batman-ak

Blur's launch trailer for the latest instalment of the Batman Arkham pits the Dark Knight against some of his greatest foes. Two Face, Harley Quinn and The Penguin all make an appearance in this action-packed launch trailer. But the real star of the show is The Batmobile; it makes its entrance in the cinematic by emerging from underneath a lake (created using RealFlow). The talents at Blur have made it look believable, dramatic and really cool at the same time. That's because in this game the promo reveals that you'll be able to have the chance to jump behind the wheel of the caped crusader's Batmobile for yourself.

RUNNER-UP



UNCHARTED 4: A THIEF'S END (E3 DEMO)

COMPANY: Naughty Dog
WEB: www.bit.ly/cg-uncharted4-e3
MORE INFORMATION: www.bit.ly/cg-making-of

The Uncharted 4 launch trailer left no-one in any doubt that the final game in the Nathan Drake saga was going to be stunning. While it utilised the game engine to render the trailer, which saw the camera pull away from a close-up of Drake's face as he awoke in a jungle, many couldn't believe what they were watching. The following gameplay demo, which saw the same character model emerge from the same jungle to tackle a guerilla army, proved Naughty Dog are the studio to watch in 2016.



Special Award 3D WORLD HALL OF FAME

WINNER



PAUL DEBEVEC

He's the science behind the movie magic of The Matrix

COMPANY: USC ICT Graphics Lab **WEB:** www.pauldebevec.com
MORE INFORMATION: www.cs.usc.edu, www.ict.usc.edu, www.usc.edu

Paul Debevec is regarded as one of the most influential visionaries and researchers in the CG scene, and it's easy to see why. Paul is associate director in graphics research and research associate professor at the USC ICT Graphics Lab, and he and his team have a long history of innovation. His research and algorithms have had a huge impact on computer graphics. In particular, his work on image-based lighting and HDR techniques have resonated around the CG and VFX world, and the 'Light Stages' he created are still widely used today.

"It's an enormous honour becoming part of the 3D World Hall of Fame, especially given the amazing contributions of the other nominees and the previous award winners. I try to develop techniques like HDRI



3D World Magazine has encouraged my work from the beginning, with its very nice articles on The Campanile Movie and Fiat Lux, and it's a wonderful community they've built to communicate and honour some of the most innovative, artistic and technical work happening in the field today. Thank you!

Paul Debevec, associate director, Graphics Research, the University of Southern California's Institute for Creative Technologies

lighting and the Light Stages because they seem different and interesting, and when they turn out to actually be useful in realising the visions of artists and filmmakers it's very satisfying," says Paul, highlighting his generosity.

RUNNER-UP

KIM DAVIDSON

COMPANY: Side Effects Software
WEB: www.sidefx.com
MORE INFORMATION: www.bit.ly/cg-houdini15

For over 26 years, Kim Davidson, president and co-founder of Side Effects has been bringing procedural solutions to digital content creators. "It is an honour to be considered among such a distinguished group of nominees," says Kim. "Everyone on the list shares a dedication to the CG community and to the artists who use our tools. I would like to thank all of the people who I have worked with at Side Effects over the years for helping me serve the community."

RUNNER-UP

TON ROOSENDAAL

COMPANY: Blender
WEB: www.blender.org
MORE INFORMATION: www.bit.ly/cg-ton-roosendaal

Ton Roosendaal is the original developer of the open-source 3D creation suite Blender, and the producer of the well-known short films Big Buck Bunny and Sintel. His work has been instrumental in getting people interested in CG. "Thanks for the nomination! It's a great feeling to be appreciated so much for your work. Without everyone else who work on Blender I wouldn't be anywhere, so the honour is theirs too!" says Ton.

RUNNER-UP

LEONARD TEO

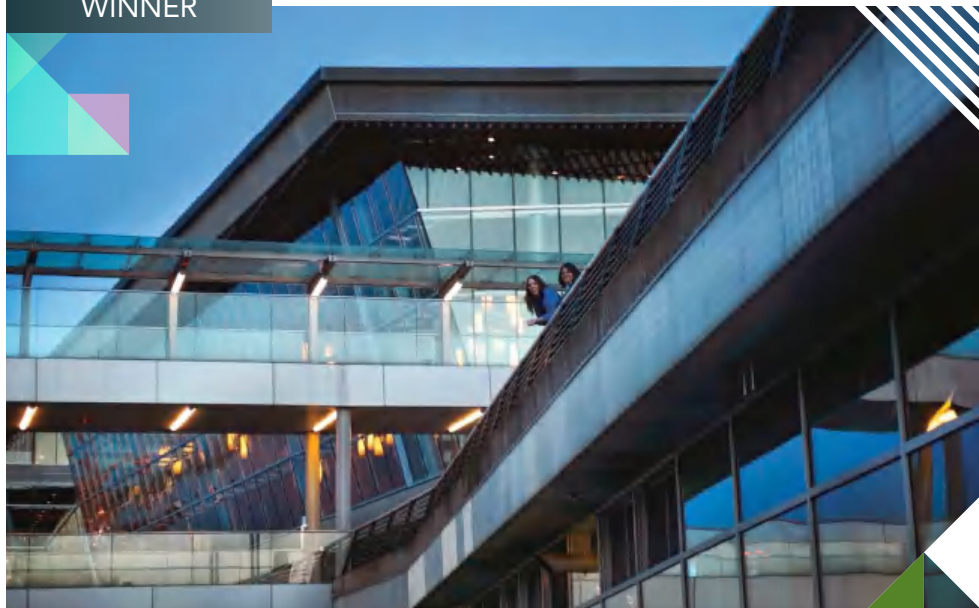
COMPANY: ArtStation
WEB: www.artstation.com
MORE INFORMATION: www.bit.ly/cg-leonard-teo

"I'm so thankful and honoured to be a runner-up for the Hall of Fame award! For the last 16 years, I've worked really hard to build platforms for artists to succeed and impact lives worldwide," says Leonard Teo, founder of CG art site, ArtStation. "What's been truly satisfying has been hearing first-hand about how artists have had their careers and lives changed through sites like ArtStation. This award motivates me to do even better for the future."



Community
LIVE EVENT

WINNER



SIGGRAPH 2014: VANCOUVER

The calendar event for all CG artists still draws the crowds

COMPANY: ACM Siggraph **WEB:** www.siggraph.org
MORE INFORMATION: www.bit.ly/cg-siggraph-2014

Moving the venue to Vancouver proved a talking point; smaller but beautiful, the Vancouver Convention Centre was a perfect venue.

Dave Shreiner, chair of Siggraph 2014, said Vancouver was, "the perfect city for a conference aimed at creating new experiences that impact on the senses. Technology, the way humans and computers interact, is rapidly growing and Siggraph is at the heart of that evolution."

It's an enthusiasm that's shared by our own CG Awards judge Jose Maria Andres Martin, who says: "I've followed Siggraph since 1994. It is the hub of the progress of CG in the world and the main reference for the industry."

It's this enthusiasm for Siggraph that makes it such a great spectacle and every year never fails to impress. Siggraph 2014 proved a stellar event in many ways: leading artists from Framestore, MPC and Disney shared their

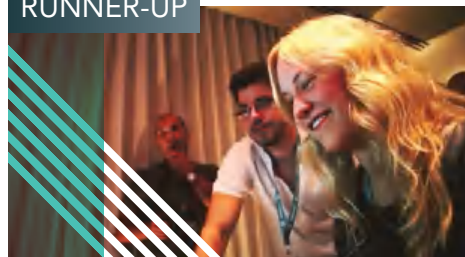
work, and in the small corners Siggraph really came into its own: The annual Computer Animation Festival offered a platform for new artists and, of course, it's not all work... Vancouver's mix of downtown bars and harbour-side glamour proved a hit.



One of the best elements of a Siggraph conference is the number of intellectual disciplines represented... artists, technologists, researchers, educators, engineers, and visionaries all converge in a single interval in space-time

Dave Schreiner, chair, Siggraph 2014

RUNNER-UP



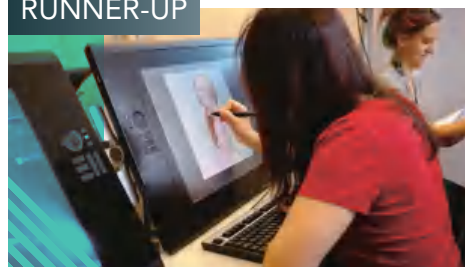
TROJAN HORSE WAS A UNICORN 2014

COMPANY: THU
WEB: www.trojan-unicorn.com
MORE INFORMATION: www.bit.ly/cg-trojan-horse

Attracting talented artists and industry leaders, Trojan Horse was a Unicorn (THU) is an international event for producers, animators, game developers, concept artists, VFX specialists and 3D generalists.

"As a relatively young event, it's incredible for us to be recognised among the giants in the industry. The artists that attend THU year on year are truly some of the most passionate and talented artists we have had the pleasure to meet, and we're proud to call them our 'tribe.' We know that they will appreciate this recognition by the prestigious 3D World CG Awards as much as we do," comments THU founder André Luis.

RUNNER-UP



FMX 2014

COMPANY: Filmakademie Baden-Wuerttemberg
WEB: www.fmx.de
MORE INFORMATION: www.bit.ly/cg-fmx-2014

FMX is the leading European conference on animation, VFX and games and has grown to become one of the key events on the conference calendar. Hundreds of artists and CG pioneers descended on Stuttgart's Haus der Wirtschaft to showcase their work and research. "It's a nice place to network, drink beer and get flabbergasted," says 3D World reader Nicolas Chaverou.

COMPETITION

WIN!

A BB-8 DROID



To celebrate the release of *Star Wars: The Force Awakens*, we are giving readers the chance to win one of five BB-8 droids by Sphero.

With this gadget you can design a route for BB-8 and control from your smart device. You can also create and send holographic videos.

BB-8 will learn to recognise your voice, and adapt personality as you interact.

Who wouldn't want one?

All you have to do to be in with a chance of owning one of these remarkable gadgets is answer the following question:

WHAT EPISODE IS STAR WARS: THE FORCE AWAKENS?

A. VII

B. VI

C. IV

ENTER ONLINE NOW FOR FREE AT

www.futurecomps.co.uk/WIN-BB8

By taking part you agree to be bound by the Competition Rules. Open to UK and Republic of Ireland residents aged 18 and over. The closing date is 11:59pm on 31 December 2015 (GMT). Five winners drawn at random from the correct entries will be entitled to one BB-8 droid each. Specification may vary from pictured model. Only one entry per household; multiple entries will be disqualified. No cash equivalent. See www.futureplc.com/competition-rules for full terms and conditions.

Note: BB-8 is controlled by a smartphone app, which is available on Android and iOS. You are responsible for ensuring that BB-8 is compatible with your phone.



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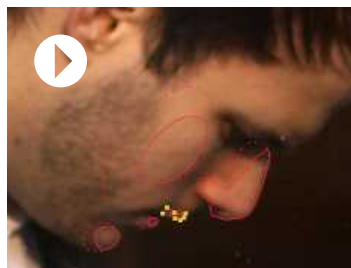
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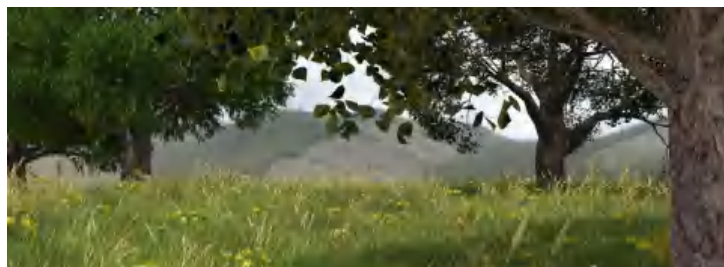
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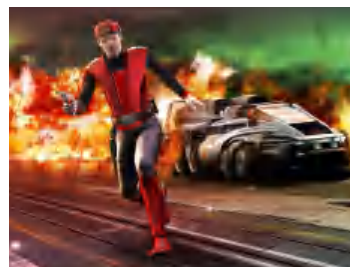
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Use the Curve tool to create subtle light interactions

Josh Parks shows how to measure subtle light changes to create interactions within a shot



AUTHOR PROFILE

Josh Parks

Josh is a compositor at MPC as well as a part-time lecturer at the University of Hertfordshire.
www.joshparks.co.uk

Compositing is all about adding the subtleties into a shot that help sell the image to the audience. One of these subtleties is getting multiple elements to interact with each other so that they integrate well into the plate.

Being in the compositing department, we're not always lucky enough to have FX and lighting create the perfect element with intricate light interaction. In this case stock footage is your friend. It might need some corner pinning and overlaying of other elements but it can save you from a tricky spot, especially with looming deadlines.

This is where the Curve tool comes in. We got familiar with this tool when I covered how you can auto crop renders in order to work more effectively. For those of you who missed it, the Curve tool node is a multi-tool, allowing you to simply create a curve of

whatever values we want it to sample. Allowing us to manipulate and plug this data into whatever we choose to.

Let there be light

This same trick can also be used in order to get a patch you've created to dynamically change to the lighting in the plate, as manually

Manually keyframing a grade node to get it to sit perfectly in your plate can be tricky and time consuming

keyframing a grade node to get it to sit perfectly in your plate can be tricky and time consuming. This technique allows you to see the other possibilities that you can use the data measured by the Curve tool for.

It involves using an expression in order to divide the initial values

of your chosen frame held frame from the values measured in the Curve tool. This gives us a value of 1 in the multiply on the frame we've held on to – with no changes to our values – and numbers fluctuating above and below 1 (brighter/dark) for the other frames. This provides the outcome of an even more perfect patch!

So once you have your perfect non-stock footage looking stock footage comp (or perfect patch) after following last month's article, how do you get the intricate little light interactions on it in order to sell your masterpiece?

In this instance we're going to use it in order to measure the average intensities of our stock. The tool will measure the fluctuations within the values and channels. Which when it comes to compositing fire is exactly what we want to be doing.

FI Download the step images from creativeblog.com/vault/3dw202

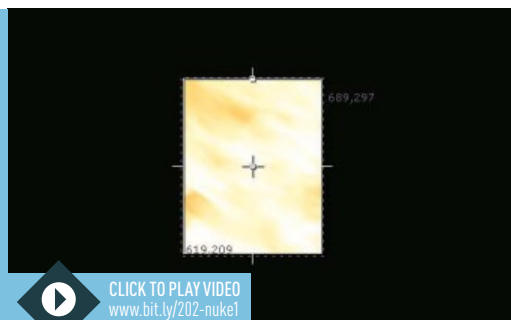
Getting the curves that are going to mask your light interactions right can make or break realistic light flickers within your shot



STEP-BY-STEP

PROCESS: MASTER THE CURVE TOOL

Josh Parks explains how to get intricate light interactions



CLICK TO PLAY VIDEO
www.bit.ly/202-nuke1

ONE CROP THE AREA

Ensure you crop the area before plugging it into the Curve tool. The Curve tool can flip out if your plate isn't cropped, so press Tab type Crop and press Enter, then plug the node into your plate. Then it's a case of adjusting the crop box to the area you want to measure your luminance from. I generally crop the area closest to the thing I want the stock footage to interact with.



CLICK TO PLAY VIDEO
www.bit.ly/202-nuke2

TWO BLUR THE AREA

Sometimes the Curve tool can give you an off value. If this happens consistently, it's often a good idea to average the pixel values of your chosen area before clicking go on the Curve tool. To do this bring in a blur node, Tab Blur then press Enter. Now drag your blur value up and give the Curve tool another go.

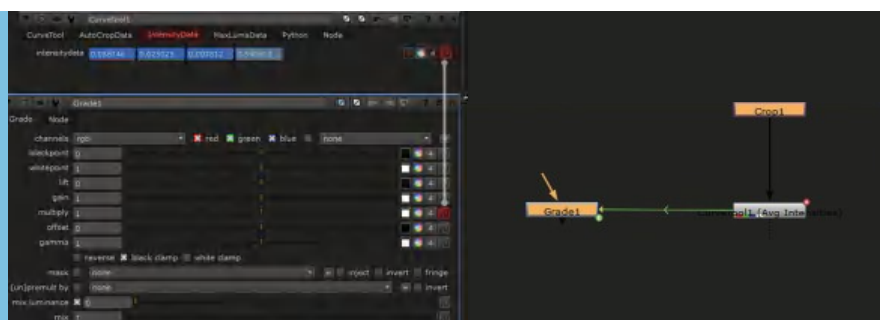


If you see the Play icon, use the link



THREE SET TO LUMINANCE DATA

As discussed in previous articles, the Crop tool is an incredible curve generating tool. In order for it to generate a curve from the light changes we need it set on Average Intensity Data. So hit Tab type Curve tool and press Enter, then plug it into your cropped plate. It should come in with Avg Intensities set by default. If not, change it from the dropdown menu then press Go.



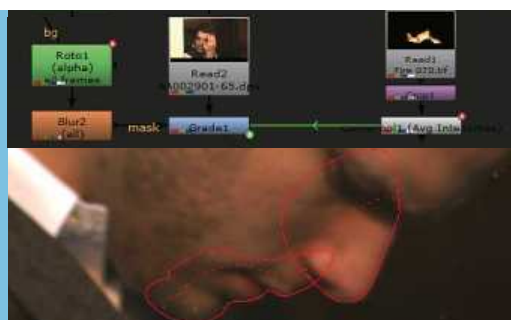
FOUR HOOK IT UP TO A MULTIPLY

We now have our curve that is representative of the light changes in our shot. To make use of these values we plug them into a multiply operation in a grade node. To find out values go into the Avg Intensities panel of the Curve tool properties and drag the button to the side of your values onto the button of the Grade Node in the Multiply section.

PATCH TECHNIQUE

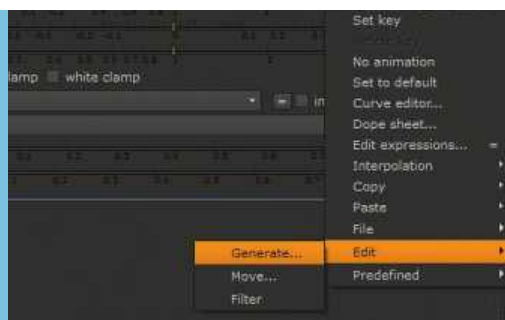
How to create a dynamic patch

This technique can also be used when patching an area that has luminance variations as we framehold. We can then paint on this area to create a static patch. To create a dynamic patch, measure the average intensities of an area with similar values to the area of your patch, then do what we did with our stock footage and apply this to a grade node on multiply and bake in the values. However, we now need to edit this expression as our luminance is correct on the frame that we held onto. As this is taken from the plate we just need the difference between the average intensities on this frame, compared to the others. If you've generated the values into the grade then the expression should be `curve/curve(frameheldframe)`.



FIVE ROTO AND GRADE

For good control over where lighting changes affect the footage, create a matte for the area. Create a roto node: use a B-Spline to create the matte by changing your Curve Type in the properties panel that appears in your viewer when your roto properties are open. Also feather shapes by [Ctrl] and dragging on a point, then blurring it slightly. Plug the matte into the mask arrow of the grade node.



SIX GENERATE KEYFRAME VALUES

With too many expressions in a script it's difficult to read what's going on, and can cause an error in Nuke scripts. Bake these values into the node, so they're not read from the Curve tool. Click the button to the right of the Multiply section of our grade node and go to Generate. Ensure Frame Range is set in the pop-up box and click Go. The Multiply box should be a darker blue to signify keyframe.



Animal Magic

Bringing animals to the screen has never been harder, *Mark Shockley* shares how GreenScreen Animals make it look easy



AUTHOR PROFILE

Mark Shockley
CEO of GreenScreen Animals, Mark co-founded the company in 2008 with Westley Koenen to fill a void in the stock footage marketplace. By merging art, technology and nature, GSA is quickly becoming the go-to digital media company for the world's best, and most exclusive animal footage.
greenscreenanimals.com

The access GreenScreen Animals can get and their care towards the animals places them in a unique position to scan and create accurate models

If your script calls for an animal, then you're going to make use of stock footage – or hire a team of CG artists to create a creature. However, the human eye will always be able to tell the difference between real and CG.

“Even in *Life of Pi* I could spot mistakes in the tiger,” says co-founder of GreenScreen Animals Mark Shockley, who explains: “There are several ways to distinguish a real animal from a CG animal. First would be the rendering. Even in the case of a photorealistic render, there are usually flaws in the lighting and shading that will expose a CG animal. Second would be the motions; unless the animator spent a lot of time studying the natural motion cycles of the represented creature, it would be apparent that the animal is not an authentic living being. To this date, there

The notion of cajoling real animals to perform during first unit production gave me nightmares

Céan Chaffin, producer, *Gone Girl*

are not many motion captured examples of animals.”

But then Mark has been working with animals for years, and has a trained eye for spotting a fake. “My wife worked as an animal trainer on a ranch in the LA area that trained rescued exotic animals. I was working in production at the time and after a few months of listening to my wife’s amazing stories I begged her to start helping out,” Mark explains. “I became so passionate about working at the ranch that I would spend all my additional time there. Once we had children my wife became a full-



The scanned data is finessed and rigged to be packaged for film VFX work



time mom and I decided to merge my two passions: production and animals. That’s how GreenScreen Animals was born.”

Creature comforts

As the name suggests GreenScreen Animals uses its connections to capture footage of animals in controlled and peaceful environments, handled by trained experts who know them. All the footage is produced under the close supervision of the American Humane Association, ensuring filmmakers who use GSA’s content do so in the knowledge that “No Animals Were Harmed.”

You will have seen GSA’s work in the opening sequence of David Fincher’s *Gone Girl*, as a deer and a raccoon encroach on the suburban world. “The notion of cajoling real animals to perform during first unit production gave me nightmares of raccoons and deer running loose down Cahuenga Boulevard,” says Céan Chaffin, producer of *Gone Girl*.

While GSA is proud to say they’re the largest provider of animal stock footage provided over green screen, Mark explains the team are looking to the future: “We want to enhance our library by adding more animals, while simultaneously developing the 3D scanning aspect of our business. We strive to be on the forefront of these emerging technologies and to do it in a humane and conscious way.” It’s the development of GSA’s CG

This chimp was created from scanning data gathered by GreenScreen Animals. The resulting model is more accurate than most animal models for film and TV



FROM 2D TO 3D

Germany’s ClonStudios has partnered with GSA to develop its photogrammetry scanning

The human brain perceives depth by comparing the images that our eyes see. If you alternate closing each of your eyes, you will notice that the object you see will seem to shift left and right. An object that is closer will seem to shift more than an object that is further away. That’s the basic concept of stereoscopic vision.

Stereoscopic vision is the core concept behind creating the illusion of three-dimensional objects and space from just two 2D images. The human brain can use all this information to calculate and tell us how far away an object is supposed to be.

In a similar way, computer photogrammetry is a technique which uses software to help map and reconstruct the shape of an object, by comparing many photographs in a modern scanner to laser or structured light scanning techniques. Photogrammetry is the only solution capable to scan live animals or fast moving objects.

work that could take the studio to another level. Few CG artists have the same access to real, often rare or endangered animals as GSA. The team are combining their green screen shoots with photogrammetrical scanning of CG art enhancements to create an anatomically correct mesh and image textures. “We are also exploring motion capture with various animals from our library, which will be matched up with the scans,” shares Mark.

Never work with animals

The aim of GSA is to take the pressure off production, after all, you never know what you’ll get when working with animals. “It’s always a surprise but we love the challenge and we love animals so it makes it OK,” says Mark. “There are certainly things we’ve learned over the years, which make a difference. For example, working with animal teams (as opposed to just one animal), and choosing the best and most responsible animal handlers.”

For more details on GSA, visit www.greenscreenanimals.com

EYE OF THE TIGER

Roaring on screen

You can see the work of GreenScreen Animals in film, TV and music videos. This is as varied as Katy Perry’s music video for *Roar*, to Wild Aid’s commercial that sees Prince William and David Beckham enter a coliseum filled with rhinos. GSA was also behind the wolf work for internet sensation *Kung Fury*.



Get more from ftrack

Hugo Guerra shows how to use Nuke Studio integration in ftrack 3.2



AUTHOR PROFILE

Hugo Guerra

Hugo is an award-winning VFX supervisor and art director, who's worked in the industry since 1999. His roles have also included project lead, Nuke compositor, VFX teacher, consultant and pipeline architect for VFX.

www.hugo-guerra.com

Whatever industry you work in, be it visual effects, video games, virtual reality, anything – the increasing complexity of the tools artists use translates into increasingly complex production schedules. No longer are Excel spreadsheets or Google docs up to the task of tracking a production; you need to embrace a solution that will give you a perspective on everything that is taking place – from the smallest tasks right up to a bird's-eye view of the entire project.

This is where ftrack comes in, which has been designed to give a holistic view over any production, allowing producers, supervisors, directors and artists to manage their workload and

approach even the most complex creative projects with ease.

Whether you're a producer overseeing a floor of artists, or an individual freelancer coming into a larger production, an understanding of ftrack is key

You need to embrace a solution that will give you a perspective on everything that is taking place

to tackling your workload and understanding exactly what the next steps of the project require.

To make things even simpler, ftrack has recently released Nuke Studio integration. The new plugin has been designed to facilitate

an even more streamlined workflow, enabling users to access ftrack without leaving the tools they're familiar with.

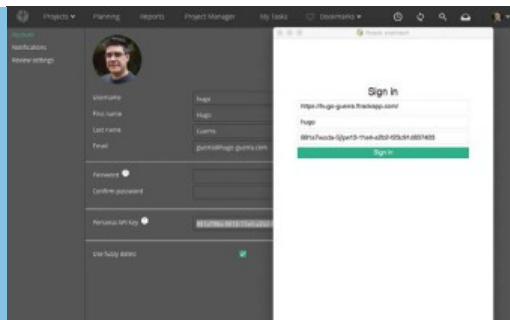
Here we'll explain the new Nuke Studio integration in ftrack, and showcase how you can set it up to ensure a streamlined pipeline. By following this tutorial, you'll understand how to work with your ftrack projects inside of Nuke Studio, without having to constantly jump between two apps during production.

You'll come away with a broader sense of how ftrack can help you manage your projects, and how it can increase your efficiency – no matter what part of a production you're involved with.

FYI For all the assets you need go to creativebloq.com/vault/3dw202



Better manage your workload and take on complex creative projects with Nuke for ftrack

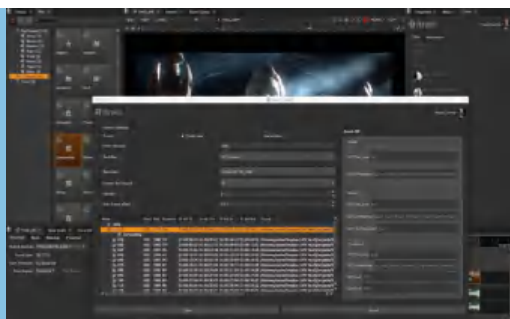
PROCESS: USE NUKE IN FTRACK*How to integrate Nuke Studio into your ftrack workflow***ONE INSTALL THE NUKE STUDIO PLUG-IN**

Download the latest connect for your OS from www.ftrack.com/portfolio/connect. Launch connect, and add credentials. To find these, login and select My Account under your avatar on the top right of the interface. Copy and paste your personal API key and add the URL of your ftrack plus username. With new projects don't select Action Context – click Nuke Studio icon.

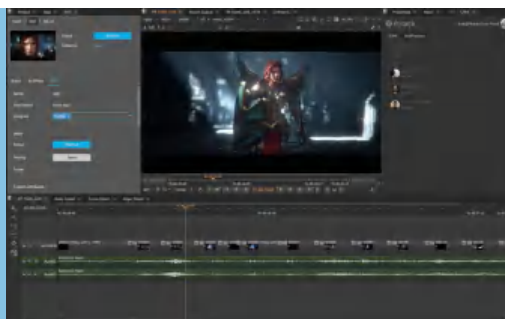
**TWO PREPARE THE TIMELINE**

Select all shots and right-click. Click Editorial>Rename Shots. Choose Sequential Rename with the pattern SH###. If you want to use sequences SQ###SH###. Go to the Tags window and drag the ftrack shot tag to the selected timeline. Choose your task types from the ftrack Task Tag folder and place on the corresponding shots. Right-click the selected timeline and go to Export Project.

Make sure you choose a workflow that uses your desired task types. All tasks will inherit the thumbnail

**THREE EXPORT THE PROJECT WINDOW**

In the Export Project pop-up, Create New is selected. If you've saved a Nuke Studio project that name will be used, otherwise it's untitled. This should be the name of your project. Choose the correct workflow, Resolution and Frames Per Second. To include Handles and a Start Frame Offset, set it here. In the lower third click on the project name to expand and preview structure and names.

**FOUR USING THE INFO PANEL**

Select the shot in the timeline you're going to work on and go to top menu's Info tab. In the panel, select the shot, not the published plate. Adjust the Status to In Progress, add a description, then use the Assignee drop-down to select the group of users to work on the shot. The group needs to be set in the browser first. For instructions go to www.bit.ly/ftrack-team.

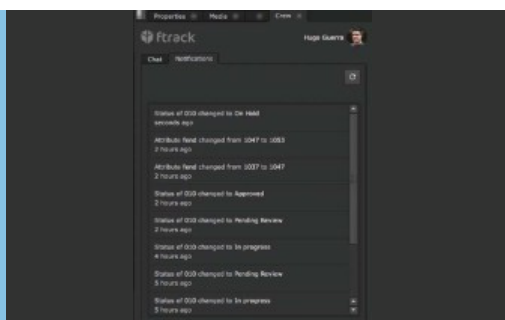
CHECK THE DEFAULTS

Adjust the Nuke Studio plug-in

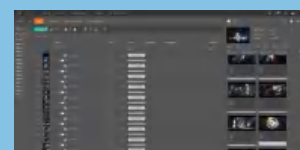
Processors are there to make life easier. By default the Nuke Studio plug-in ships with publish, review, thumbnail and proxy. However, if you want to disable the proxy processor, then on a Mac you need to right-click on ftrack-connect.app in your Application folder, then go to Show Package Contents in Applications>ftrack-connect.app>Contents>MacOS>resource>ftrack_connect_nuke_studio>processor and move the proxy folder. On Windows go to C:\>Program Files>ftrack-connect-package>resource>ftrack_connect_nuke_studio>Processor and move the proxy folder. You can learn more about processors here: www.bit.ly/202-ftrack.

**FIVE CHAT SETTINGS**

Go to the Crew Panel then the Chat tab. This shows a list of users in the project. They're split into four categories. Contributor: users who have published versions that you've got in the timeline. Related: users assigned to the shots you have in the timeline. Other: all other users. Offline: offline users. Click on a user to start a real-time chat. Nuke and Nuke Studio support Chat.

**SIX UNDERSTANDING NOTIFICATIONS**

The same Crew panel has a Notifications tab with a notifications feed. Status changes, new versions and changes to frame start and end show up. This tab is also supported in Nuke, so you're kept up to date without leaving the app. In the browser go to your ftrack and change the status on one of your shots. In Nuke Studio go to ftrack>Crew>Notifications and click the refresh icon.



The Nuke Studio processors build on the event system used in ftrack



Marvelous Designer 5

PRICE \$59.99 (monthly) \$360.00 (annual) \$550.00 (perpetual) | COMPANY CLO Virtual Fashion Inc. | WEBSITE www.marvelousdesigner.com



AUTHOR PROFILE

Cirstyn

Bech-Yagher

Cirstyn is a freelance CG artist and educator, with over a decade's experience in 3D, focusing on modelling and texturing.

www.northernstudios.com

MAIN FEATURES

You can now cut and sew internal shapes into separate pattern pieces

Offset as Internal Line (Improved Inset function for short)

AutoSync removes the need for manual sync in the 3D pane

Show X-ray Joints makes posing and resetting poses easier and better

Improvements in OBJ Export options



Need to generate digital garments, and fast? Then give Marvelous Designer a spin, as the new updated release more than holds up its reputation for fast and easy digital garment creation – despite this release's lack of wow features.

Clothing CAD software Marvelous Designer was first released in 2011, and a lot has changed since 3D World first covered that edition. No longer a startup, South Korean company CLO3d, makers of all things Marvelous Designer now caters to clients like Konami, EA, ILM and Disney – in addition to arch-viz (as seen in a number of items in this year's IKEA catalogue) and the occasional fashion designer (often found skulking in their forums).

They've honed their development path into a reliable and stable set of releases; gone are the lofty plug-in and feature

The new features play to Marvelous Designer's strengths... speed and ease of creation

promises and an annual release cycle is now the norm, with releases consisting of a solid mix of new features, user requested enhancements, and optimisations. This works. Really well.

Improved workflow

The new features in this update play to Marvelous Designer's strengths, which above all are speed and ease of creation, for example in comparison to nCloth or 3ds Max's Cloth modifier. The new ability to cut directly into your pattern, rather than having

to trace all items first, is a definite workflow improvement in both speed and user-friendliness.

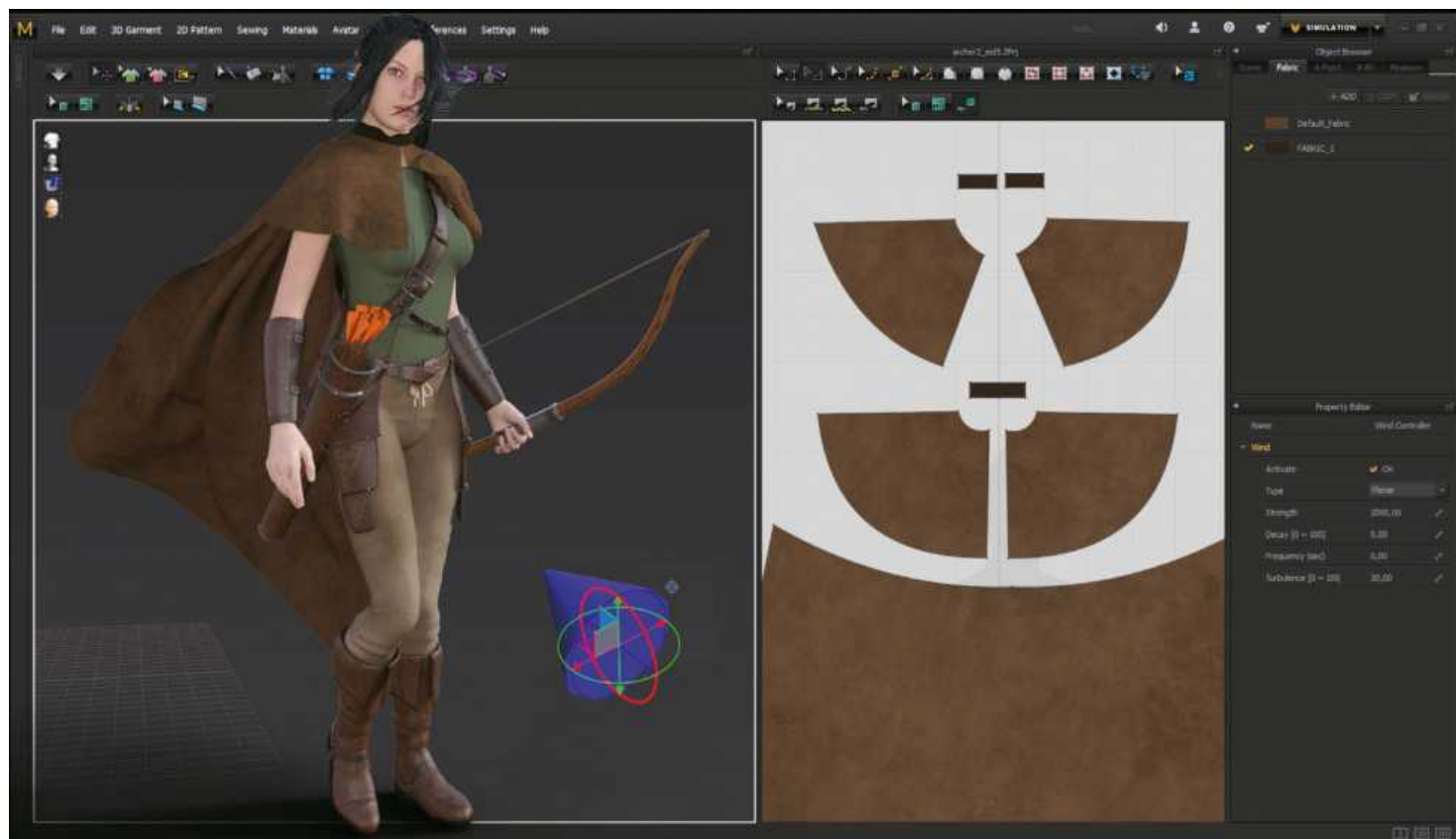
This is especially the case when you use it together with another new feature: Offset As Internal Line (Inset without depth for any subdivision modeller), which in effect means more precision and easier creation and positioning of anything from fold lines to holes, not to mention the reduction it provides in copy, pasting and placing. Where this really shines, is when you use it together with Cut and use it with another new feature: Copy As Pattern, which means your cuts can now be cut and copied as patterns as well, rather than just internal lines.

There are a few other improvements which really aid your workflow as well; imported meshes with bones are now easier to pose, thanks to the rework of showing x-ray-bones rather than

Marvelous Designer 5 is its best release yet, and a definite must-have for any cloth or clothing orientated toolkit

CLO3D'S MARVELOUS DESIGNER

South Korean company CLO3D first shipped Marvelous Designer, a CAD clothing generator, in 2011. Since then its increasing popularity lets you find the items you can create with it in places from the Polycount Forum to games like Metal Gear Solid V, with a detour via Disney, ILM and The Hobbit films.



Significant simulation speed improvements, even with wind, are sure to make the ready-to-render crowd happy

points in the Avatar/Points foldout. Show X-ray-Joints now allows bones to be edited or reset to the original pose. These features, together with the tweaked and visibly faster simulation algorithm, makes this a lot less hassle, and fun to work with than previous versions.

Import and export items have also received an overhaul. You can now export in LKO format for Modo, and the Object Export menu has also got some much needed TLC; you now have a bigger set of export options, including updated quad thickness, XML metadata, and can export with internal line information, together with the new – but still simplistic – UV-guide, which places all pieces of the meshes' pattern into a UV grid.

Despite this being as close to a rock solid release as you can get, there are a few issues the MD team

should address. The 2D pattern-editor is still very basic, and a potential clutter magnet, as there's no image editor-type layering functionality. When working with multi-garment sets this can be a hassle, despite the freeze option in the 3D rendering view.

Still a leading software

The arrangement and bounding volume editors could use more functionality, like mirroring and UI optimisations, such as rotation and positioning spinner/sliders, and a simple sort option in the object browser and its tabs. Even though the current UI facilitates this to an extent, it could use more clarity – as could the manual.

These aside, if you're looking to create clothes with ease and speed Marvelous Designer beats most other applications hands down.

VERDICT



IN PRACTICE: TRIS VS QUADS

Despite this being a really good release, I did have an issue with unwelded tris when converting to quads, as it seems not everything gets quadrangulated, especially on double-sided meshes. You can fix this on load in UV Layout's Weld and/or Clean on load, or by using ZBrush's ZRemesher for retopologising, if you don't want to weld them by hand. It's not that big an issue for stills, but if you're animating, rigging, or creating any kind of commercial content, make sure to check this in your mapper to avoid issues down the line.



Forester for Cinema 4D

PRICE \$350, £304 (inc. VAT), €341 | COMPANY 3DQuakers | WEBSITE www.3dquakers.com



AUTHOR PROFILE

Steve Jarratt

Steve has been interested in CG for many years. He's a regular contributor to 3D World and edited the magazine for two years.

bit.ly/steve-jarratt

The title of this plug-in suggests that it will populate your landscapes or arch-viz scenes with trees and foliage. And indeed it does just that – but even as a version 1.0 release, Forester does a whole lot more besides.

Lebanese developer Charbel Koueik has distilled the patterns of nature into a series of mathematical formulae, which lets you design a practically limitless array of flora, from simple grasses and gnarled trees to the most complex of fantastical plants.

Intuitive software

Everything in Forester is procedurally generated, with a slider for every facet of the mesh. So not only do you get instant visual feedback as you alter values, you can also animate them – mainly for growth, but also for other effects. All the controls are pretty intuitive, but there's a whole heap of tutorials on Vimeo explaining every feature and function. And, failing everything else, you can just click on one of the many presets for an instant plant or tree.

Making plants and trees with Forester is easy – lighting, texturing and rendering takes a lot longer to get right

You can use C4D R17's new Variation shader to add diversity to grass or leaves

Models appear with basic textures, but it's a simple case of adding materials to each one and then using selection tags such as petal, leaf, stem and so forth to differentiate each part. UVs are handled automatically, so it's a doddle to add a texture map and alpha from your collection and generate good-looking leaves or petals. Also, because foliage is largely based on the same poly count, you can use C4D R17's new Variation shader to add diversity to grass or leaves for even more realistic results (although it would be nice to have this hardwired in).

For animated scenes, Forester features Hyperwind, which creates the effect of a breeze moving through your greenery. Again, this previews in real-time in the main viewer (depending on the

complexity of the model), and looks great. It can be a CPU-hog but the resulting animation can be cached for use in other scenes.

Room to experiment

We do have a few issues: trees are created as a collection of swept splines, but you don't get a nice smooth intersection at the joint. Also, they're quite featureless – no lumps or knots or growths – and can't be pruned or displaced to suit, so if you need a hero model you're better off looking at the likes of SpeedTree. There are other minor quibbles, but these are largely personal preference.

Forester is a hugely impressive debut; brilliantly designed, easy to use and rock solid. With the right textures and lighting it's capable of producing lovely results – and we suspect that experimental C4D users will find ways of abusing it for more than just trees, flowers and rocks. It sounds like the developer has plenty of features on his to-do list, so we look forward to seeing how this budding plug-in matures over the coming seasons.

VERDICT



MAIN FEATURES

Procedural tree and plant generator

Multicloner for object scattering

Dedicated rock generator

Hyperwind animation system

Includes dozens of preset models



DEVELOPING THE PLUG-IN

Forester was originally developed for Softimage, but when Autodesk end-of-lifed it, the developer needed to look elsewhere. The first signs of Forester for C4D appeared back in May 2014, with a projected launch in summer/autumn – clearly development has taken longer than expected, but version 1.0 comes pretty feature-packed.



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Dave Cook

Jellyfish Pictures' joint head of 3D reveals how a love of Gerry Anderson set him on his career path



Dave discovered the difference between being a fan and a professional when his career began on *The New Adventures of Captain Scarlet*



ARTIST PROFILE

Dave Cook

Dave studied at the Slade School of Fine Art where he developed an interest in drawn animation. He has worked in animation and VFX since 1992 and is joint head of 3D and CG supervisor at Jellyfish Productions. www.bit.ly/dave-cook

Like quite a few people of my generation I got into the business partly by accident. I studied fine art in London, while working part-time painting cels for studios in Soho. It was only when I saw a job posting on AWN.com for the *New Adventures of Captain Scarlet* based out at Pinewood Studios that I really committed to a career in 3D.

When I had been a small child Gerry Anderson shows were pretty much the most exciting thing I had ever seen. Now years had passed and my son was four and just discovering these shows for himself – and he loved them just

as much as I had: *Captain Scarlet*, *Thunderbirds*, *Stingray*. All Gerry Anderson's shows had a completely developed world that seemed futuristic and plausible. They were unique and dramatic, being a bit longer and more intricate in terms of plot than other kids' shows. And then there were the models, the planes, the mind-boggling assortment of ground vehicles and spaceships. To bring that world to life in 3D and on a TV budget was a genuinely exciting challenge.

I think everyone who worked on it would agree that the show ended up being a little uneven. Some of it looked fantastic and some of it

When I had been a small child Gerry Anderson shows were pretty much the most exciting thing I had ever seen

didn't. It brought home to me very clearly the difference between being a fan of a show and being a content creator. But that helped me at the start of my career in 3D; by taking me back to my childhood ambitions and showing me what that really meant, it helped me grow up. At least a little!

See more of Dave's work at www.jellyfishpictures.co.uk

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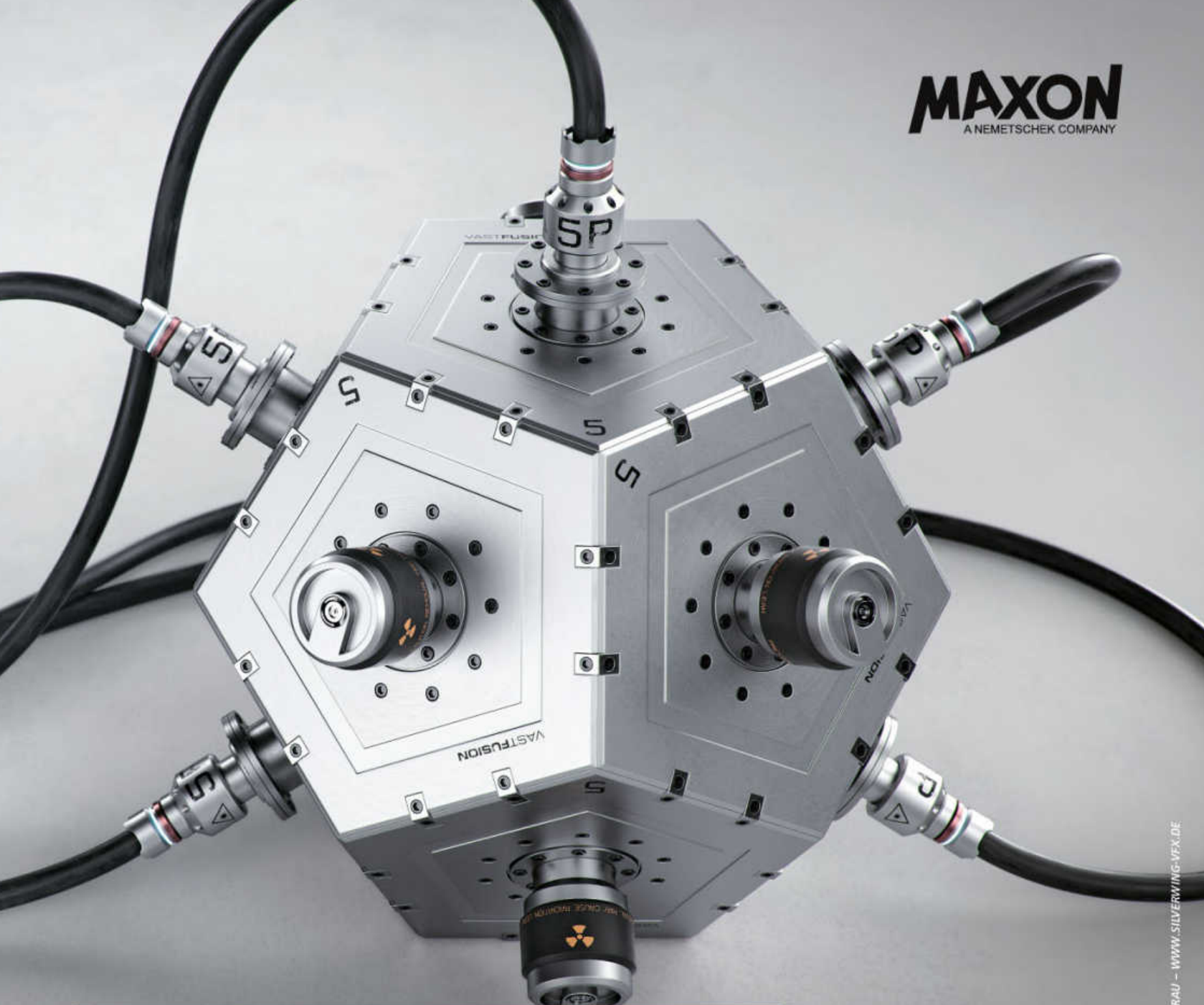
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